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LAKE SUPERIOR.

INVESTIGATIONS BY JOINT INTERNATIONAL COMMISSION,

1894.

DECREASE OF FISH GENERALLY.

DECREASE; GENERAL -- LAKE SUPERIOR.

West End.-- When he first came here they used to get all the fish they required within 15 miles of Duluth.--(Cooley).

West End.-- There has been a decrease in the fish without question. The whitefish, principally, have decreased, but there has also been a decrease in the trout. As to fishes in general, his idea is that the decrease has been only along the shores where they have been doing the most fishing, and if the nets were carried farther out they would get plenty of fish.--(Coventry).

Isle Royale.-- The fishermen around Isle Royale do not make much fishing. Would not get as many fish from there now altogether as in 1882.--(Flynn).

Isle Royale.-- The fishing in this part of the lake is becoming poor.--(Johns).

West End.-- All kinds of fish are much less abundant than they were 4 years ago. About $1/2$ as many taken this year as last. (E. Smith).

Wisconsin.- Fish on the south shore have constantly decreased in numbers.--(Draglund).

Apostle Islands.- Fishes are not as abundant as they were 10 years ago. Thinks there is not one whitefish now where there were 100 then, but there has not been so great a diminution in the trout. Thinks the decrease began some 5 years ago and has been rapid, especially in the case of the whitefish.--(James Smith).

Chequamegon Bay.- He has been fishing in Chequamegon Bay, but gets no fish there now to amount to anything.--(LaBelle).

Bayfield.- He caught lots of fish 3 years ago, but since then has not done very well. The fishing was pretty good 8 years ago, but was better 3 years ago, before that the whitefish played out pretty well.--(LaBelle).

Chequamegon Bay.- The past spring he probably bought from the fishermen about here not to exceed 500 or 600 pounds a week. They have not been catching as many fish in the Bay during the past 2 or 3 years as they used to. They had about 2 weeks of pretty good

fishing this spring and then it dropped right off again.--(Mathson).

Bete Grise.-- As to the abundance of fish cannot say exactly. Did not notice any material decrease while he was fishing. Thinks however, that the fish have not decreased more than 25 per cent.--(Croze).

Bete Grise.-- Was of the opinion that the trout and whitefish are not so abundant in this locality as in former years having decreased possibly $1/4$. The decrease has been rapid. Noticed it first about 6 years ago.--(Berriault).

Portage Entry.-- The market fishes are apparently not so abundant as in former years, yet at intervals of a few years they seem to be abundant. The catch at present is about $1/2$ that of former years, but it may be better later in the season. Does not know that the decrease has been especially rapid at any particular time.--(Quinn).

Marquette.-- In 1864 they could get all the fish they wanted with a very small amount

of netting and fishing right off the break-water here.--(Grant).

Marquette.-- Both the whitefish and lake trout have decreased very much around here. They have been scarce for at least 10 years.--(Goodwin).

Marquette.-- Trout and whitefish are not as abundant as they used to be.--(Anderson).

Marquette.-- The whitefish and trout began to decrease before he came here and he does not know what is the cause of it, he has not been here long enough. It does not pay him to fish for those species, but the herring help out.--Hanson).

Whitefish Bay.-- I suppose I have caught more fish out of 100 rods of gill net right of Taquamenon Island in 16 or 18 fathoms that they can catch there now in 2 miles of net anywhere they have a mind to set them. There was no decrease while he was fishing. The most he would fish would be a mile of gill net to a boat, now they have 30 miles.--(Roach).

North Shore.-- At times when the runs come along they will get just as good fishing on the lake shore as they did a number of years

ago for a short time, but there is a class of fish that do not migrate as much as other classes (He refers to whitefish in this connection and his explanations are given under the Movements of Whitefish).-(Ganley).

St. Mary's River.- He has lived at the Soo 14 years. The fishing is not nearly as good here now as when he first came here.-(Kirvan).

Port Arthur.- Fish were more abundant in Lake Superior when he came here than now. There was not as big a body of fish here as in Lake Huron.-(Marks).

Port Arthur.- There are not more than $\frac{2}{3}$ the number of fish in the lake at present that there were when he began fishing. The decrease began about 5 years ago and has been gradual ever since.-(Trombley).

Port Arthur.- As the fish have been decreasing we have been increasing the number of pound nets. I have had 9 pound nets in the water, but have only 7 fishing now, 2 having been broken up, the pots were rotten

and I did not have money enough to buy new ones. We are allowed to use 5 nets here apiece. We used to catch as much in one pound, say 10 years ago, as we take in 3 now.

There were more fish in Thunder Bay 4 years ago than there have been since I came here. They came in here about November 10 and didn't leave until February. They were a different quality of fish from what I had seen here before, little fat chubby fish. I never saw them before and have never seen them since. There were a great many of them then.

Fishing was better with me this year than last year. Last year I was in the hole altogether and this year I don't think I have enough to keep me all the winter.--(Servais).

Fish are not as plentiful as they were formerly. Probably now 1/2 as many. The decrease began about 7 or 8 years ago and has not been rapid.--(Davis).

Port Arthur.-- There were pound nets in here about 10 years ago and a few 16 years ago. Most of the fishing was done about 6 years ago. They had the most pound nets about 3 or 4 years ago. Fish were most abundant here about 7 years ago and they have decreased

steadily since then until 4 years ago, when we got the run of whitefish late in the fall and that stayed here all winter and went away early in the spring. As a whole the fishing has deteriorated greatly, both for pound nets and gill nets. Does not know the cause unless it is that the fish are caught out.

There were not many more pound nets here 3 years ago than now. Now there are about 28 pounds and 3 years ago there were not many more than that. When the fish were most abundant we could catch them with gill nets and pound nets both. There was twice as much gill netting then as now. They fished the whole year. They could fish where we are fishing the pound nets and get good whitefish there. Where I am fishing at present and have been fishing for about 9 years, I fished 12 years ago with gill nets and used to get good fishing summer and winter. But then my ground is as good as any other around here that has not been fished long.--(Servais).

Port Arthur.-- Fish are not half as abund-

ant as they were some years ago. There has been a great falling off both in Whitefish and trout. There has been a large falling off especially in the number of whitefish taken particularly during the past 4 or 5 years.--(Murray).

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DECREASE OF FISH---LAKE SUPERIOR.

Minnesota.---There are not as many fishermen on the Minnesota shore as there used to be. It seems to me that they used to catch a great many more fish than they do now. There may possibly be as many fishermen as there used to be, but they do not catch as many fish as they used to. He knows that with the same number of men they would get 3 or 4 times as many fish in 1882 as they do at present. There used to be a great many fish along the head of the lake in those days (Flynn).

Port Arthur.---Fish are now so scarce relatively that the pound nets do not pay well. The catch is so small that some who would like to set pounds cannot afford to pay for the licenses. Some pounds are said to be owned which are not now put in the water on that account. There seems to be no question of a decrease in the ~~pounds~~ abundance of fish in this region which amounts to a good deal. Capt. Servais says that 1 pound 10 years ago would take as much as 3 pounds do now (Rathbun).

CONDITION OF FISHERIES -- LAKE SUPERIOR.

Thunder Bay, Ont., is pretty well fished out, but the north shore, where Ainsworth & Ganley are fishing is a good ground.-(S. H. Davis, Detroit).

INCREASED CATCH DUE TO INCREASE OF APPARATUS.
LAKE SUPERIOR.

West End.---Mr. Coventry has been here since 1886. Up to last year the receipts of fish have been increasing in quantity, but they have been putting in more netting to get them. In 1893 there was an increase catch received by them of about 10 per cent over the year before. During the previous year the increase for one year had been about 25 per cent. Previous to that, during his connection with the business, the annual increase in receipts of fish had ranged from 5 to 15 per cent.

In 1893 the fishermen probably put out 4 times the amount of netting they did 4 years before. The first year the A. Booth Company came up here they spent about \$1,000 in fishermen's outfits. The next year about \$1,500, and last year (1893) about \$6,000 for nets, hooks, etc. This year they have not done very much, only expending about \$1,000.(Coventry).

DECREASE OF WHITEFISH.

WHITEFISH---LAKE SUPERIOR.

DECREASE.

Port Arthur.---Were more abundant when he came here (Marks).

There never were many fishes here compared with the lower lakes. Water too deep close in shore. Not more than $\frac{2}{3}$ the number of fish now as when he began fishing. Decrease began about 5 years ago. Size has not materially decreased (Trombley).

Used to catch as much in 1 pound as we do now in 3--say 10 years ago. Were more fish in Thunder Bay 4 years ago than any time since I have been here (Servais).

Probably $\frac{1}{2}$ as many as formerly. Decrease has not been rapid. Some decrease in size, from 3 to $2\frac{1}{2}$ lbs. on an average (Davis)

Most of the fishing was done here about 6 years ago. Most pounds here 3 or 4 years ago. Fish were most abundant about 7 years ago, and decreased steadily until 4 years ago when we

got this run of whitefish late in fall and they stayed here all winter. As a whole the fishing has deteriorated for both pounds and gills (Servais).

Large falling off especially during past 4 or 5 years; size considerably smaller (Murray)

General.---Thinks the catch during past 3 years will compare very favorably with preceding 3 years in Lake Superior. Fall of 1893 catch was light, accompanied by bad weather (Wires, 1).

Has been a marked decrease around the Apostle Islands and between there and Duluth. Is not certain about Marquette and Keweenaw Bay. Thinks there has not been any marked decrease in Whitefish Bay, off Whitefish Point and Grand Marais, and on Canada shore at east end (Wires, 3).

Wisconsin.---They seem to be getting smaller all the time between Duluth and Bay-field (Kalmbach, 5).

West End.---A decrease of 90% in whitefish (Kalmbach).

Wisconsin.---The last year Palmer set pounds along Wisconsin Point, about 12 or 14 years ago, there were no whitefish, and that was the case then all along the south shore (Cooley, 6).

South Shore, Wisconsin.---Used to be good whitefishing in July and August. Before he gave up the business would be bothered to get them in the summer. Up to that time had probably decreased 25%--12 to 14 years ago. When he first came here used to get all the fish they required within 15 miles of Duluth (Cooley).

West End.---At the time the hatchery was established here there were absolutely no whitefish to be caught on the south shore, between Duluth and Bayfield. Since then they have come up again. The Booth Company became so strapped for lack of whitefish at this end of the lake that they had to go to Canada for them (Coventry, 9).

South Shore, Wisconsin.---Thinks the fish have been caught out near the shores, and if the nets were carried far enough out would get plenty of fish (Coventry).

West End.---Whitefish have decreased more than the trout. This year there are no whitefish at all (E. S. Smith).

West End.---Believes the stock is run down (E. S. Smith).

Isle Royale.---The whitefish used to be more abundant (C. O. Flynn).

West End.---All kinds much less abundant than 4 years ago (E. Smith).

Bayfield.---The whitefish have decreased more than trout. Used to take more whitefish in proportion than they do now (Johnson).

Bayfield.---Fish on the south shore have constantly decreased (Draglund).

Bayfield.---Whitefish have been falling off ever since he has been here. Some years a little better than others, but a decrease in the fishing right along. Taking the average

of the last 3 years, the catch of whitefish now would not be more than $1/3$ what it was during the previous 12 years. The last 3 years have been exceptionally poor. It had been falling off before, but a big drop occurred about 3 years ago.

The average size of the whitefish is smaller than formerly. Get fewer No. 1 whitefish than they used to (Chafe).

Sand Island.---Whitefish are not as abundant about the islands and in the channels as formerly, but he believes they are still in the lake. The decrease has not been rapid, nor is it apparently permanent. Last year there was a good catch of fish both in number and size. Three years ago there was as large a catch as there has been in 25 years. Has possibly been some decrease in size, especially in the number of very large specimens, but the average has not changed materially (Shaw).

Apostle Islands.---Not one whitefish now where there were 100 ten years ago. Decrease began some 5 years ago and has been rapid. Also decrease in average size (Jas. Smith).

Bayfield.---They hardly ever get any here now (LaBelle).

Chequamegon Bay.---Gets no fish there now to amount to anything (LaBelle).

Bayfield and vicinity.---Caught lots of fish 3 years ago, but since then has not done very well. Fishing pretty good 8 years ago, better 3 years ago, but before that the whitefish played out pretty well (LaBelle).

Houghton.---Did not notice any material decrease while fishing. Thinks the fish have not decreased more than 25 per cent (Croze).

Keweenaw.---Believes the decrease only apparent, due to use of larger mesh, catching fewer fish (Teddy).

Thinks the decrease of whitefish has been fully 50 per cent (Teddy. His statements are not coherent).

Betc Grise.---Decreased possibly $1/4$;
decrease has been rapid. (Berriault). Size has
decreased 10 per cent.

Portage Entry.---Not so abundant as in
former years; yet at intervals seem to be
abundant. No decrease in size (Quinn).

Marquette.---In 1864 they could get all
the fish they wanted with a very small amount
of netting, and fishing right off the break-
water (Grant).

Marquette.---Have decreased greatly.
Have decreased every year for the last 25
years to his knowledge. 25 years ago fisher-
men could go out 2 or 3 miles outside of the
harbor and load their boats with whitefish,
using a comparatively small number of gill
nets to what they use now. Has seen immense
quantities caught in the bay here in the fall,
every one weighing 10 or 12 lbs. Has known
fishermen to go up in the fall to Harbors
Mills on Granite Point with a small sail boat
and salt 500 or 600 kegs of 100 lbs. each in

6 weeks, fishing not over 1 or 2 miles from shore. Have not been able to do that for at least 15 years. If a sail boat should go out now 4 or 5 miles they would not get $\frac{1}{4}$ as many fish with the same amount of twine as at that time.

The whitefish do not average as large as they used to, but get big ones occasionally, principally on the shore.

Several years ago on the south shore here they used to catch the large humpbacks, weighing 12 or 15 lbs., in the fall, using 6 inch gill nets. They are scarce now to what they were (Grant).

Marquette.---The whitefish have decreased very much; have been scarce for at least 10 years. Are smaller than they used to be (Goodwin).

Marquette.---Not as abundant as they used to be (Anderson)

Marquette.---Began to decrease before he came here. Does not pay him to fish for whitefish and trout alone (Hanson).

Marquette.---The whitefish have been the most serious loss as this species is prized the more highly than the others. Their ratio of decrease has universally been described as much greater than that of the lake trout; in some cases very much greater. To arrest the decrease of whitefish would be the most important thing to accomplish on Lake Superior.

Fishermen have at times attempted to express the amount of decrease in figures, but nothing accurate could be expected from them in that particular as they have no way of fixing the amount of increase of apparatus, etc. (Rathbun).

Whitefish Point.---The decrease of whitefish has been over 50 per cent in proportion to the amount of netting used, between the present time and years ago. Thinks the decrease commenced about 7 or 8 years ago on this part of the shore. Nothing has been done in the seining and the pound net fishing has been decreasing on the outside shore quite rapidly.

There are less of those large fish caught now than there were years ago.

When he first started it was more trouble to dress the fish than it was to catch them. Some days when the fish came on good he hauled in as many as 1200 or 1400 lbs. at one haul of the seine. Might possibly make 2 or 3 such hauls during the week. There has also been a decrease in their size, fewer of the large fish also being taken (Clark).

Whitefish Point.---There has been more whitefish in the bay this spring so far than there has been for 2 years. They have run larger this year than they had been before.

The whitefish are not as abundant as they used to be. They do not catch as many as they did formerly. The decrease has been very great. For the last 4 or 5 years does not know as he has seen any marked decrease; it has been gradual. They got very good fishing in 1884, but in 1885 they got none to speak of. It got so poor the tug would come in with from

400 to 700 lbs. The year before that they only fished half as many gill nets and got 3 or 4 tons every day. In 1884 they were all whitefish. They would raise one end of the net and the net would float until they raised the other end. The fishing then was done mainly up the shore about 15 or 20 miles above here, as far as half way to Grand Marais, and from 5 to 10 miles off shore.

The average size of the whitefish is about the same now as formerly, but our large ones, what we call slabs, have decreased. Those are the ones taken in the spring and fall. They have the big hump-backed whitefish now in the early spring, but there are not nearly as many of them as there used to be (Endress).

Whitefish Point.---Used to be very abundant, but have been getting scarcer every year. Are becoming very scarce. This applies to the humpbacks.

Thinks the ordinary fish have averaged

larger in size this year than before (Shaver).

Whitefish Point.---knows nothing personally about the decrease. When he first came here the man who run the pounds used to tell him a good deal about it; and he told him the net right off the point had lifted 100 packages from one night out (Kimball).

Whitefish Bay.---I have caught more fish with 100 rods of gill net right off Taquamenon Island, in 16 or 18 fathoms than you can catch now in 2 miles of net anywhere. There was no decrease while he was fishing. Thirty years ago two men could make good wages with 100 rods of net (Roach).

Whitefish Bay, etc..---Have taken 494,000 big whitefish in August from 100 rods of gill net.

The whitefish would range a good deal larger then than now (Roach).

Whitefish Bay, etc.---Does not think there has been any perceptible decrease. As a whole, catches more than he used to, but has extended his apparatus to do it. This spring there have been more whitefish in the bay than for several years (Johnson).

Getting more whitefish in Whitefish Bay than they used to, but could not say about the decrease as there is no way of measuring it (Ainsworth).

St. Mary's River.---Has known John Bouché to catch 42 half barrels in one day and evening --1,400 or 1,500 in one day (Roach).

Have decreased here in the river (Ganley).

Not as abundant in the river as they used to be. 6 or 7 years ago there were 7 or 8 pounds in the river, and now the pound fishing is practically nothing (Ainsworth).

North Shore.---Have decreased. Has been fishing there 13 years. Are catching more than they used to with increased plant (Ganley)

The whitefish seem to be gradually depleted (Elliott).

Port Arthur.---Not $\frac{1}{3}$ as many as there used to be. May catch as many with increased apparatus. Size has remained about same (Trombley).

There has been a decrease possibly of $\frac{1}{2}$ lb. in average size, from 3 to 2 $\frac{1}{2}$ lbs. (Davis).

WHITEFISH--DECREASE--LAKE SUPERIOR.

General.---In Lake Superior the catch was light last fall, but the weather was bad and it was impossible to tell what it might have been under better conditions. Thinks that the record of Lake Superior during the past 2 or 3 years will show that the catch has been a fair one taken altogether. Thinks that the catch during the past 3 years will compare very favorably with the preceding 3 years in Lake Superior (Wires).

General.---At the eastern end of the south shore they seem to be catching about as many whitefish now as they used to. This is not the case, however, at the more western places such as Marquette, Keweenaw Bay, Apostle Islands and the shore between there and Duluth. Thinks that in Whitefish Bay and off Whitefish Point, Grand Marais, and on the Canadian shore there probably has not been any marked decrease. Is not certain about the condition

of affairs at Marquette and Keweenaw Bay. There has, however, been a marked decrease around the Apostle Islands and between there and Duluth (Wires).

Wisconsin.---The last year Palmer set pounds along Wisconsin Point, 12 or 14 years ago, there were no whitefish, and that was the case then all along the south shore (Cooley).

The whitefish stopped all of a sudden 10 or 12 years ago (Cooley).

West End.---The Booth Company became so strapped for lack of whitefish at this end of the lake that they had to go to Canada for them. At the time the hatchery was established here there were comparatively no whitefish to be caught on the south shore between Duluth and Bayfield. Since then the whitefish have come up again (Coventry).

West End.---The whitefish have decreased more than the trout. There are not so many pounds now as formerly simply because they cannot get enough fish to pay them to use them (E. S. Smith).

Bayfield.---Whitefish fishing has been falling off ever since he has been here; some years it would be a little better than others, but a decrease in the fishing right along. Taking the average of the last 3 years, the catch now would not be more than $\frac{1}{3}$ what it was during the previous 12 years. The last 3 years have been exceptionally poor. It had been falling off before, but had a big drop about 3 years ago (Chafe).

Sand Island.---Whitefish especially are not as abundant about the islands and in the channels as formerly. He believes, however, that the fish are in the lake. The decrease has not been rapid, nor is it apparently permanent. Last year there was a good catch of fish both in number and size. 3 years ago there was as large a catch as there has been in 25 years (Shaw).

Chequamegon Bay.---They claim that the whitefish are getting scarce; that they have caught too many of them (Information obtained from a stranger).

Marquette.---The whitefish have decreased greatly. Has been a decrease every year for the last 25 years to his knowledge. He has been here 30 years. 25 years ago fishermen would go outside of the harbor 2 or 3 miles and load their boats with whitefish, using gill nets and only a few lbs. of thread comparatively to what they are using now. Has seen immense quantities of whitefish caught in the bay here in the fall, every one weighing 10 or 12 lbs. Has known fishermen to go up in the fall to Harbors Mills on Granite Point, with a small sail boat and salt 500 or 600 kegs (100 lbs. each) in 6 weeks, and not fish over 1 or 2 miles from shore. Have not been able to do that for at least 15 years. If a sail boat should go out now 4 or 5 miles they would not get $\frac{1}{4}$ as many fish with the same amount of twine as they would 15 years ago (Grant).

Marquette.---In 1879 or 1880 from one pound net about 6 miles down from here they took 900 to 1100 lbs. of whitefish, none weighing less than 9 or 10 lbs.(Anderson).

Marquette.---The whitefish have been the most serious loss. This species is prized the most highly. Everywhere we have been told that the Lake Superior whitefish are ahead of any from the other lakes. Price here is generally slightly more than for lake trout. Their ratio of decrease has been universally described as much greater than that of the lake trout. In some cases very much greater. Fishermen have at times attempted to express the amount of the decrease in figures, but nothing accurate could be expected from them in that particular as they have no way of fixing the amount of the increase of apparatus, etc.

To arrest the decrease of whitefish would be the most important thing to accomplish on Lake Superior (Rathbun).

Whitefish Point.---When he first started it was more trouble to dress the fish than it was to catch them. On some days when the fish came in good I have hauled in as many as 1200 or 1400 lbs. at one haul of the seine, and that would be as many as we would care to handle for the day. Would make but the one haul. Might probably get 2 or 3 such hauls during the week (Clark).

Whitefish Point.---The decrease of whitefish has been over 50 per cent in proportion to the amount of netting used between years ago and the present time. This decrease commenced about 7 or 8 years ago on this upper part of the shore. There has been nothing done in the seining, and the pound net fishing has been decreasing on this outside shore quite rapidly. It was his impression at first that the fish were shifting to the other side of the lake and that they would get them again after a while. There are less of those large fish caught now than there were years ago (Clark).

Whitefish Point.---There have been more whitefish in the bay this spring so far than there has been before for 2 years.

The whitefish are not as abundant as they used to be. They do not catch as many now as formerly. The decrease has been very great. For the last 4 or 5 years does not know as he has seen any marked decrease. It has been gradual. In 1884 got very good fishing, and in 1885 none at all to speak of. It got so poor the tug would come in with 400 to 700 lbs. The year before that they only fished half as many gill nets and got 3 or 4 tons every day. In 1884 they were all whitefish. They would raise one end of the net and the net would float until they raised the other end. Out of 4 tons to a lift does not suppose that they would have got 100 lbs. of trout. They were all whitefish that weighed about 2, 2 $\frac{1}{4}$ and 2 $\frac{1}{2}$ lbs. The fishing then was done mainly up the shore about 15 or 20 miles above here, as far as half way to Grand Marais. Fishing was done from 5 to 10 miles off the shore (Endress)

Whitefish Point.---The very large whitefish used to be very abundant, but have been getting scarcer every year. Are becoming very scarce (Shaver).

Whitefish Point.---Does not know about the decrease of the whitefish. When he first came here the man who ran the pound nets used to tell him a good deal about it, and the net right off the point he told him they had lifted 100 packages from 1 night out (Kimball).

St. Mary's River.---Dip net fishing is carried on only right in the rapids. Has known John Bouche to catch 42 half barrels of whitefish in one day ^{and?} at evening. Thinks he has caught 1400 or 1500 in one day (Roach).

Whitefish Bay.---Gets more whitefish now, but it is on account of going out so much deeper. Does not think there is any perceptible decrease in the whitefish. As a whole catches more whitefish now than he used to, but has extended his apparatus to do it. Is not fishing any more nets, but goes out into deeper

water. The general impression in Whitefish Bay is that the whitefish are as abundant as ever. This spring there have been more whitefish in Whitefish Bay than for several years. The 3 tugs from Whitefish Point fished in the bay all the spring and could get more fish than they get outside with the gill nets (Johnson).

St. Mary's River.---The fishing here in the river has decreased very much (Ganley).

St. Mary's River.---The whitefish are not as abundant in the river as they used to be. There has been such a decrease that 6 or 7 years ago there were 7 or 8 pound nets fished in the river, but now pound net fishing is practically nothing (Ainsworth).

Whitefish Bay.---In Whitefish Bay they are getting more fish than they used to, but could not say anything about the decrease there because there is no way of measuring it (Ainsworth)

Port Arthur.---Whitefish have decreased in abundance. Not $\frac{1}{3}$ as many as there used to be. They claim they catch as many altogether now with increased apparatus, but have to use more nets to do it with. The size of the whitefish has remained about the same.
(Trombley).

whitefish, unless a stop is put someway to cleaning them out every year with seines and pounds. That is the only way he can see in which they can be increased.--(E. S. Smith).

Isle Royale.-- They catch a good many whitefish in Bays around Isle Royale yet in the fall, but not nearly as many as they do trout. The whitefish used to be more abundant along there. Has heard of their going down there and catching any amount of them in the pounds nets when they came in on the feeding grounds and probably to spawn at the same time.--(Flynn).

Port Arthur.-- Has seen them put a gill net in at Thunder Bay, Canada, in the morning and at night it would be floating on the water just full of whitefish.--(Flynn).

West Side Keweenaw.-- As to the abundance of fish now and in former years, Mr. Teddy thinks that so far as whitefish are concerned they have decreased fully 50%, the decrease has steadily been going on for several years.--(Teddy).

Marquette.- There is a time when whitefish come along a little better than they do at others, but there seems to be no such time now. About this season whitefish used to come into shallow water.--(Goodwin).

North Shore.- Whitefish have decreased along the Canadian coast. He has been operating on the North shore for 13 years. They have increased their plant probably $1/3$ during the last 5 years. One reason for the increase being the demand for fish for the World's Fair. Altogether they catch more whitefish than they used to, but this species is not as abundant as it was formerly.--(Ganley).

North Shore.- The whitefish seem to be gradually being depleted, according to the catches made and the way in which they are fishing.--(Elliott).

DECREASE OF WHITEFISH---LAKE SUPERIOR.

Wisconsin.---The following has reference to his fishing on the south shore some 12 or 14 years ago: They would take trout and whitefish. They only kept that up for a few years but up to the time they quit they got more whitefish than trout during July and August. Before we gave up the business we would be bothered very much to get whitefish in the summer. It got so we did not do any fishing at this end of the lake in summer. Would all go to Isle Royale and the Apostle Islands. Also had a crew on York Island. Whitefish had not decreased very much, but had some, probably about 25 per cent at this end of the lake (Cooley).

DECREASE OF LAKE TROUT.

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LAKE TROUT--DECREASE--LAKE SUPERIOR.

Port Arthur.---Have decreased to the same extent as whitefish (Trombley).

Among the fishes which used to be taken in Thunder Bay in gill nets in the early part of the fishery (Trombley).

Have decreased in size (Davis).

Great falling off in abundance, but not in size (Murray).

General.---Thinks they are not as abundant in Lake Superior as they were a few years ago (Wires).

West End.---For the past 10 years he thinks there has been a decrease in the trout of fully 50 per cent (Kalmbach).

West End.---We used to get big fishing for trout along the Minnesota shore anywhere off Lester River and up that way (Cooley).

Have decreased in this end of the lake during his time (Cooley).

West End.--There has been a decrease in the trout, but not to the same extent as with the whitefish. Thinks the decrease of fishes in general has been only along the shores where the most fishing has been done; that if the nets were carried far enough out they would still get plenty of fish (Coventry).

West End.---Believes that the stock of fish is run down. (E. S. Smith).

Not as abundant as they used to be. Not 1 now where there used to be 10. No decrease in size (E. S. Smith).

Isle Royale and Minnesota.--Trout are the principal fish taken on the north shore and around Isle Royale. There are not nearly as many there, however, as there used to be. The fishermen around Isle Royale do not make much money fishing. Would not get as many fish now from there altogether as in 1882 (Flynn)

West End.---Thinks the size the same now as formerly (Flynn).

West End.---Do not get as many as they used to (Borgensen).

Isle Royale.---Fishing in this part of the lake is becoming poor. When he first began fishing here would catch as much as 1,000 lbs. a week; now he only gets 250 lbs. (Johns).

Wisconsin.---All kinds of fish are much less abundant than they were 4 years ago; not $1/2$ as many taken this year as last (E. Smith).

Bayfield.---The trout have not decreased as much as the whitefish (Johnson).

Bayfield.---Decreased probably about $1/3$ since he has been here; not as much as the whitefish. Not apparently smaller (Chafe).

Bayfield.---The fish on the south shore have constantly decreased in numbers (Draglund)

Apostle Islands.---Fishes are not as abundant as they were 10 years ago. This decrease began some 5 years ago. The trout have not decreased to the same extent as the whitefish. The size has also decreased (James Smith).

Bayfield.---The fishing was pretty good 8 years ago, but was better 3 years ago. Since then it has not been very well (LaBelle).

Have not decreased as much as the whitefish (LaBelle).

Houghton.---As to the abundance of fish, cannot say exactly. Did not notice any material decrease while fishing. Thinks, however, that the fish have not decreased more than 25 per cent (Croze).

Bete Grise.---Of opinion that trout and whitefish are not so abundant in this locality as in former years, having decreased possibly $\frac{1}{4}$. Decrease has been rapid. First noticed about 6 years ago. Also a decrease in size (Berriault).

Portage Entry.---Market fishes are apparently not so abundant as in former years; yet at intervals of a few years they seem to be abundant. Present catch about $\frac{1}{2}$ that of former years. Does not know that the decrease has been especially rapid. No marked decrease in size (Quinn).

Marquette.---Have decreased nearly as much as the whitefish, and began about as long ago (Grant).

Marquette.---Both whitefish and lake trout have decreased very much around here. They have been scarce for at least 10 years. Does not see any difference in the size of the lake trout, although they do not catch as many large ones as they used to (Goodwin).

Marquette.---Not as abundant as they used to be (Anderson).

Marquette.---The trout as well as the whitefish began to decrease before he came here. Does not pay him to fish for this two species alone (Hanson).

Marquette.---Have not decreased nearly as much as the whitefish (Rathbun).

Whitefish Point.---More abundant than they used to be. Get a larger percentage than they did years ago, because then they caught nearly all whitefish. Take more trout now per pound net than they did then. Trout have been more

plentiful for the last 5 or 6 years (Endress).
No difference in average size.

Whitefish Point.---Has been growing gradually more abundant from year to year, and is now much more common than it used to be. Supposes it must be due to the work of the hatcheries (Shaver).

Whitefish point.---At the present time the proportion of 200 lbs. of lake trout to 1 ton of whitefish in the pounds would be big at this season, later in the year begin fewer trout. Formerly the trout were far less common and sometimes would not get over 80 lbs. in 7 or 8 tons of whitefish (Shaver).

Whitefish Bay.---I suppose I have caught more fish with 100 rods of gill nets off Taquamenon Island in 16 or 18 fathoms than they can catch there now in 2 miles of nets. There was no decrease in the fish while he was fishing (Roach).

North Shore.---At times when the runs come along they will get just as good fishing on the Lake Superior shore as they did a number of years ago, for a short time (Ganley).

Does not think they have decreased. Sees no difference in their abundance (Ganley).

North Shore.---No difference in their size (Ainsworth).

LAKE TROUT--DECREASE--LAKE SUPERIOR.

① General.---Is of the opinion that lake trout are not as abundant in Lake Superior as they were a few years ago. See further observations under Lake Huron (Wires).

West End.---The trout had decreased in this end of the lake during his time. Could not do much this side of Agate Bay, but then the railroads have come in there. They could get some here, but not to any extent. On the south shore he never did much with trout in the fall except across in the middle ground in November, but did not fish much there either (Cooley).

West End.---The trout are not near as abundant as they used to be. There is not one fish now where there used to be 10 ten years ago (E. S. Smith).

② Lester River.---Do not get as many trout as they used to (Borgenson).

Bayfield.---The lake trout have not decreased as much as the whitefish, but probably about $\frac{1}{3}$ since he has been here (Chafe).

Bayfield.---The trout have not decreased as much as the whitefish (LaBelle).

Marquette.---The lake trout have decreased pretty nearly as much as the whitefish and began to decrease about as long ago as the whitefish. The siscowet have not decreased so much because they have not been fished for (Grant).

Marquette.---It is said that the lake trout have not decreased generally as much as the whitefish (Rathbun).

Whitefish Point.---This species has been growing gradually more abundant from year to year and is more common now than it used to be. I suppose it must be due to the work of the hatcheries (Shaver).

Whitefish Point.---Lake trout are more abundant than they used to be. They get more trout in proportion. They get a larger percentage of trout now than they did years ago because they caught nearly all whitefish then. They take more trout now per pound net than they did then. Trout have been more abundant for the last 5 or 6 years (Endress).

North Shore.---Does not think the trout have decreased as he does not see any difference in them (Ganley).

Port Arthur.---Trout have decreased to the same extent as the whitefish. There are not as many as there used to be (Trombley).

Port Arthur.---Among the fish which used to be taken in the gill nets in the early part of the fishery in Thunder Bay (Trombley).

DECREASE; LAKE TROUT -- LAKE SUPERIOR.

West End.- There has also been a large decrease in the trout. For the last 10 years he thinks the decrease has amounted to fully 50%.- (Kalmbach).

Isle Royale.- Trout are the principal fish that are taken on the North Shore and around Isle Royale. There are not nearly as many there now, however, as there used to be.- (Flynn).

Whitefish Point.- Formerly trout were far less common and sometimes they would not get over 80 lbs. in 7 or 8 tons of whitefish.- (Shaver).

TROUT; DECREASE --- LAKE SUPERIOR.

General.- The regular trout they catch in Lake Superior is on the decrease.--(S. H. Davis, Detroit).

Whitefish Point.- Whitefish Point is the best place on Lake Superior. The trout still harbor about that point and their catch is immense.--(S. H. Davis, Detroit).

DECREASE OF HERRING.

HERRING--DECREASE--LAKE SUPERIOR.

Duluth. Is of the opinion that the herring are not so numerous in Lake Superior as they were. (S.P.Wires).

Duluth. It is certain that herring have not decreased in this lake. They seem to be getting more plenty every year. (J.Coven-try).

Duluth. There has been no decrease in the herring. (E.S.Smith).

Off Lester River. Herring are just as abundant as they ever were. (S.Borgensen).

Bayfield. Herring are just as thick as they ever were. Herring fishing has never been extensive enough to catch them off--only a little fishing in the fall. (I.Chafe).

Apostle Islands. There are just as many herring as there ever were. You cannot destroy them. Last fall the town here was

flooded with herring and they shipped them and used them for their own use. They had 30 pots and some of them would have as much as 3 tons at a lift, having the pot entirely full.

The fact that the herring are no less abundant than they used to be would indicate that there was no use hatching them on the lake. About the first of November they are very thick here indeed. (J.La Belle).

Marquette. The herring are more abundant than they used to be. (A.Grant).

Marquette. The herring are so very abundant about here that there is no chance of their causing any decrease in them with the number of persons who are fishing here now. There are just as many herring here now as when he came here 6 years ago, so far as he can tell. (A.Lorntzson).

Marquette. Herring are very abundant.

There are just as many herring here now as ever. (Nels Hanson).

Whitefish Point. Does not know much about the herring, except that they are very abundant about here, and thinks they are more abundant than they used to be. They caught more herring this year than any year before that he knows of. (Endress).

North Shore. Herring are as abundant as they ever were. (J.Ganley).

HERRING; DECREASE -- LAKE SUPERIOR.

Marquette.-- Herring are more abundant than they used to be. Thinks just as the other fish decrease the herring increase, because they are the main food of the other fish. The herring have not been fished for to amount to anything for many years.--(Grant).

There are 10 herring now where there was 1 formerly. As the trout are caught out the herring have a chance to live and increase.--(Anderson).

The herring do not seem to need protection at present. They are said to be even more abundant than they used to be, and this might readily happen by catching off so large a proportion of lake trout. The fishermen claim so at least. The herring are the chief food of the trout, at least where they can get them.--(Rathbun).

The fishermen also say that the herring are the principal food of the lake trout, and the latter being now very much reduced in

numbers, has given the herring a chance to increase. Therefore, with the slight present demand for herring, there could be no especial harm in allowing their capture in legitimate ways that would not do harm to more important species.--(Rathbun).

DECREASE OF STURGEON.

STURGEON; DECREASE.

(See also under previous heading).

Port Arthur. Get nearly as many here now as we used to. They used to make caviar here, but not now. They do not get enough eggs is the reason they do not now. (Trombley).

The sturgeon have decreased. Used to get more sturgeon at one time than we do now. There were more caught years ago than now. (Servais).

Apostle Island Region. They have decreased; used to be very abundant. Has seen enough sturgeon in one net, so that it took them 2 days to clean the net out. Sturgeon used to be very abundant here 20 years ago, but they have pretty well played out. On the other side of Bad river they may get some yet. (La Belle).

Whitefish Point. They have not fallen off in quantity that he knows of, and there has been no particular decrease in the size. (Endress).

Sturgeon are getting very scarce. (Shaver).

Whitefish Bay. Sturgeon have decreased since he has been on the lakes. They are a fish that gets caught off very quickly. Does not know hardly what should be done with them. Sturgeon are a shallow water fish, and there are not a great many of them in Lake Superior. They are only in the bays and they soon get caught off, as the grounds are so small. (Johnson).

The sturgeon used to be very much more abundant. (Roach).

St. Mary's River. Five or 7 years ago they used to get lots of sturgeon by scooping, but they are getting very scarce. (Bouche).

They used to be more plenty down on Lake George years ago than they are now. Does not think they have been caught up, but have gone to other grounds. (Kirvan).

North Shore. They have kept just about the same, and are not any less abundant than they used to be. (Ganley).

They were quite plenty in Bachewauaung and Goulais Bays 6 or 7 years ago. They would get a ton or more a week, and now they get only an occasional one. (Ainsworth).

CAUSE OF DECREASE, GENERAL.

POSSIBLE CAUSES OF DECREASE OF FISHES,
LAKE SUPERIOR.

Pollutions.

Duluth. Sewage from city may affect the fisheries close by, but probably not to any extent. The sewers empty into the lake at different points.

Marquette. Sewage runs into harbor. Gas works refuse runs into harbor. Dredging about wharves has done some harm.

Whitefish Bay. No sewage or tanneries.

Soo. Government dredging has spoiled fishing in the rapids.

Port Arthur. No pollutions.

Logs and Mill Refuse.

Wisconsin, between Superior and Bayfield.
Rafts have interfered with pound netting.
The rafts are made up close by the shore.

Damage done by rafts breaking up and going on the shore. This has been during past 10 or 12 years. Bark gets into pounds, and, by clogging meshes, tends to hold in the smaller fishes, &c. Saw only one saw-mill along this shore. No evidence was supplied to show injury to fishes.

Bayfield and vicinity. Johnson says saw-dust goes in from all the saw-mills along the shore; also some trouble with bark; but his evidence related to injury to fishing and not fishes.

Chafe doesn't think saw-mills have done much harm, nor the rafting. Bark sometimes prevents hauling of seines.

Apostle Islands. Much damage to pounds sometimes by logs and floating drift-wood.

Decrease of fish due more especially to logging, distribution over the bottom of saw-dust and bark. (Jas. Smith).

Chequamegon Bay. Examined the situation carefully. The mills are all burning their sawdust, and there is no further danger from this source, whatever may have taken place in the past. The shores of the bay are pretty well strewn with logs and drift-wood.

Grand Marais. Sawdust has done much toward ruining fishing grounds. Smaller ones more harmful than the larger, allowing the sawdust to flow down into the lake. This should be stopped, where the debris would enter fishing waters. (Connable).

Marquette. Nets are damaged a good deal by water-logged stumps, wood, &c. Some refuse here from the saw-mills that comes in from the streams. It is strewn along close to the shore, and does more harm to pounds than gills. (Grant).

Wherever saw-mills run out their sawdust must do harm to whitefish. A good many on

the rivers here from which the sawdust comes out. No whitefish spawning grounds about here to be hurt. (Goodwin).

Sawdust has been banked up around some of the mills about here, and the currents have carried it off. They find slabs and such stuff all over the bottom, and it has hurt the gill nets. No refuse around the pounds. (Anderson).

Whitefish Point. Logs drifted on the shore and bark has caused decline of seine fishery. Sawdust also used to drift down from Deer Park. (Clark).

Not troubled with sawdust, but their nets get full of bark, and he has also seen it in the gills of whitefish. Rafts pass here 2 or 3 times a week. (Endress).

Whitefish Bay. No trouble where he fishes now, but in Taquamenon Bay there was a mill from which he was bothered by the edg-

ings and slabs. Now they burn them. As a whole the saw-mills are not doing any damage to the fishing, as there are not enough of them. Log towing is a nuisance to the fishing. In many places they have been in the habit of letting sawdust run into the streams. (Johnson).

Waika Bay. Is full of mill refuse.

Canada Shore. No saw-mills. Practically no log towing.

Cinders.

In the tracks of steamers cinders and clinkers are a great annoyance to gill nets.

Traffic.

Wires thinks it has had something to do with injuring the fishing near Duluth. The same has also been claimed with reference to some parts of St. Mary's river.

CAUSES OF DECREASE -- LAKE SUPERIOR.

West End.- Thinks the reason for the decrease is that years ago, when he first came up here on the fishing grounds, there were always streams where whitefish and trout and all other fish used to go for their spawning grounds, and they would get into places and spawn then which were nicely protected, such as harbors and bays. Believes that there were more results from their spawn and their spawn would become well impregnated and come to maturity all right and result in young fry. Now, however, every stream in the country is blocked against them by lumbering, saw mills or something of that sort. They were driven off the nice grounds and are in deeper water where their own reproduction is lost entirely.--(Kalmbach).

West End.- Believes the decrease to be caused by the fishing being cleaned out with the seines and pound nets. Knows that the fish all go on shore in the summer. About the trout it is pretty hard to say. Does not

understand them. They are slower growing and probably more eggs are destroyed than with other species.--(E. S. Smith).

West End.-- He thinks the decrease is on account of so many fish being taken from the water during the spawning season and the spawn not taken care of. Around Isle Royale fishermen do not have much respect for the spawn and they do not try to save the eggs.--(Flynn).

Isle Royale.-- Thinks the decrease was caused by the pound nets which were formerly set here. When he first began fishing here he caught as much as 1000 pounds a week, while now he only gets 250 lbs.--(Johns).

Wisconsin.-- Could offer no theory for the great decrease except that quantities of young were taken by the seines and small meshed pound nets.--(Draglund).

Apostle Islands.-- The decrease is due to the catching out of great numbers of fish, but more especially to the logging business the distribution over the bottom of the lake of sawdust and bark.--(James Smith).

Chequamegon Bay.- They put in a break-water here about 4 miles long and that disturbed the fish.--(LaBelle).

Bayfield.- The gill nets take a good many spawning fish, because they are fished in the spawning season. The tugs have run the fish off more than the pound nets.--(LaBelle).

Bete Grise.- Attributes the present scarcity of fish to the use of too small a mesh and the use of the seine, the mesh of which goes as low as 1 1/2 inches.--(Croze).

West Side Keweenaw.- Believes that the fishermen do not get too many fish and that possibly the reason they do not get as many as they did in former years is on account of the mesh having been made larger.

Can give no cause of the decrease of 50% in whitefish as stated by him, but suggests that it may be on account of the fishermen having to use too large a mesh (Yet Mr. Teddy declares that he has seen fish taken in the pound nets which it would require 3 or 4 to make a lb.)--(Teddy).

Bete Grise.- Assigned as a cause for the decrease

that too many fish are taken. Was of the opinion that the catching of spawning fish in the fall was largely responsible for the decrease.--(Berriault).

Portage Entry.-- Can give no cause for the decrease unless it is the increase of the pound nets.--(Quinn).

Marquette.-- He is pretty well persuaded that if the tugs had not commenced to fish out of here the fishing would have been good for 50 years. A sail boat used only about 1/3 as much twine as the tugs.--(Goodwin).

Marquette.-- Does not know what has caused the decrease unless it is that the fishermen have cleaned them all out. Thinks there has been too much fishing here, which has killed off the fish. The decrease began when the tugs came here. They would throw the offal overboard and that would kill the fish off.--(Anderson).

Marquette.-- The smaller fishermen lay all the decrease of whitefish and trout to the extensive fishing by tugs. The tug fishermen, besides what they say against seines

and pounds, consider that the several tugs of a few years ago, coming from elsewhere, were responsible for the trouble. Goodwin, however, lays the decrease to the tugs in general and says it would have been better had they all continued to fish with sail-boats and small rigs.--(Rathbun).

Whitefish Point.-- The reason why there are more fish in Lake Superior than any other lakes is that they do not fish for them here in the spawning season.--(Shaver).

Whitefish Point.-- The only thing he can lay the decrease to is too much fishing. Nothing in the world, in his opinion, will kill a fishing ground quicker than a tug. A tug will fish in 3 or 4 fathoms in the fall when the fish are spawning. Their tug will fish about 4000 leads to a lift and have 5 lifts.--(Pratt).

Whitefish Bay.-- The cause of the decrease is from so much fishing, so many gill nets and so many pounds.

Regarding the amount of apparatus, you know that years ago it was the poor man who

fished, now it is the rich man. The poor man cannot fish now because it takes too much capital to fit him out. 30 years ago 2 men would take 100 rods of net and a little boat, go up the shore and could make good wages fishing. Now the only way they can do is to fish on shares. 90 miles of netting is too much for one Company to have. The richer these fellows get the more tugs and nets they put out. Thinks Endress Bros. cleared \$45000. last year.--(Roach).

North Shore.-- They find that on the places where they fish too much twine it drives the fish off, and while it doesn't catch them all out, it drives them away.--(Ganley).

North Shore.-- Ainsworth and Ganley do not know whether it is the nets which keep the fish out or whether they have actually decreased.--(Rathbun).

Port Arthur.-- The decrease has been caused both by gill nets and pound nets. It is on account of the deeper water. There is not as much chance for fish to breed here

as in Saginaw Bay and such waters. There never were very many fish here compared with the lower lakes. The great drawback with this lake is that the water is too deep too close in shore.--(Trombley).

The cause may be from the large numbers having been taken from the water and from frightening the fish away by the twine and offal. Possibly driven out more than caught out.--(Trombley).

Could assign no reason for the decrease unless it might be the destruction of the small fry by certain apparatus, notably pound nets.--(Murray).

CAUSE OF DECREASE OF FISH --- LAKE SUPERIOR.

Apostle Islands.- Various reasons are given for the cause of this depletion, the most plausible of which appears to be the logging industry. Timber has been taken from the islands and adjacent shores, and floated to mills in the water. Thousands of logs every year soak and grind off the bark in these waters. This is supposed to cover the food of and in otherwise hinder the feeding of the whitefish. As many as three fishermen stated that it was noticeable that after an unusually heavy loggingwinter the fishing was correspondingly poor the next summer.

The amount of twine in these waters, even if used injudiciously and destructively, would, in the judgment of the best fishermen, not deplete the waters so rapidly, since little or no fishing is carried on during the spawning season.-(Woolman).

CAUSE OF DECREASE OF FISH---LAKE SUPERIOR.

Port Arthur.---No cause can be assigned to the absence of fish from Thunder Bay except over fishing. The bay is large and deep, and is clear water. The Government breakwater in front of Port Arthur necessitated some blasting, but that could not have had a lasting effect upon the fishes (Rathbun).

CAUSE OF DECREASE OF WHITEFISH.

WHITEFISH; CAUSE OF DECREASE - LAKE SUPERIOR.

MISCELLANEOUS.

West End.- Thinks too much pound net fishing was one cause of the decrease. There are half a dozen theories advanced to explain the cause of their leaving. Some claim that it was on account of commerce and others that it was the blasting of the rock on the North Shore that drove the fish away.-(Cooley).

CATCH OF SPAWNING FISH.

Wisconsin.- The whitefish came in to spawn on the south shore and would be taken by the gill nets in the spawning season, but not very much by the pounds, on account of the stormy weather. Never but once or twice to his knowledge have pounds been set in the Fall and they have never made a success of it. Gill nets, however, are set on the spawning grounds in the spawning season. There were never fish enough taken with the pounds in the spawning season to have depleted the

whitefish.--(Cooley).

SMALL WHITEFISH IN THE SEINES.

Wisconsin.-- They used to catch some small whitefish here in the winter with seines right off Minnesota Point on the Duluth side of the channel, between there and the main shore a distance of $1\frac{1}{2}$ mile. On the south shore they never took whitefish under 1 or $1\frac{1}{2}$ lbs. There were 2 or 3 years that the Finlanders took small whitefish with herring in the seines under the ice.--(Cooley).

POUNDS NETS.

Wisconsin.--It is his opinion that pound nets are not especially responsible for the decrease of whitefish, because they stopped all of a sudden and almost entirely, about 10 or 12 years ago.--(Cooley).

MISCELLANEOUS.

Has often wondered what was the actual cause of the decrease. Thinks they have

gone down on the Canada shore. Does not know of anything being done at this end of the lake that would tend to deplete the supply. Doesn't think there are enough whitefish caught within 20 miles of Duluth to affect the matter at all.--(Cooley).

DESTRUCTION OF SMALL WHITEFISH BY SEINES.

Wisconsin.-- Seining on the south shore has done harm to whitefish in the past, but last season was about the last they had any seining there to amount to anything. They were employed both in the spring and fall. Two or 3 falls ago there were a good many seines on the south shore between Wisconsin Entry and Bayfield. They would take whitefish into market that were too small to be marketable, and we would make them salt them. It was a hard job to salt them and the fishermen wanted to sell them fresh. They kept on hauling the seines anticipating getting larger fish, but instead of that they always got the same, and because they could not sell

them fresh they dumped them on the shore. That discouraged the men who were fishing seines on the south shore. Last spring, 1893, and the year before we got quite a few from the seines and they seemed to be pretty good sized at the beginning, but along toward the end they got small again, running from $1/4$ to $1/2$ lb. apiece. In the spring of 1893 fishermen started in with their seines and would bring whitefish in and for a while they were all right good sized fish, but they soon commenced to get small ones and when they did so we commenced to kick and tell them they must salt them, that discouraged the seine fishermen, and this spring (1894) there wasn't a seine put in. There has been no fall seining for whitefish since they got such a bite 3 years ago, when they dumped hundred of tons of small whitefish on the beach.-(Coventry).

SPAWNING WHITEFISH IN SEINES.

Wisconsin.- The seines were employed along the south shore in the spring and also in the fall during the spawning season. They

They used to haul them over the whitefish spawning grounds. Two or 3 falls ago there were a good many seines between Wisconsin Entry and Bayfield.- (For further details see under destruction of small fish by seines).- (Conventry).

POUNDS AND SEINES.

Wisconsin.- Cause of decrease of whitefish is because they have had so many pound nets and seines going that they have simply cleaned them out. There are not as many pounds now as there used to be, simply because they cannot get enough fish to pay them to use them.- (E. S. Smith).

Bayfield.- The only causes he knows of for the decrease of the whitefish are the seines and pounds. Seining is bound to be destructive to small fish.- (Chafe).

MISCELLANEOUS.

Sand Island.- Thinks the cause of the apparent decrease is due not to the number of

fish taken from the lake, but to the decrease in their food. Believes the decrease in the food caused by the logging business. The great amount of sawdust and bark thrown into the lake has covered the food of the fish so that they have been obliged to change their ground. Thus, the heavier the logging, the lighter the catch of fish.--(Shaw).

SMALL FISH IN POUNDS AND SEINES.

Sand Island.-- Young fish are not taken except in pound nets and in fine meshed seines.--(Shaw). .

GILL NETS.

Bayfield.-- The cause of the decrease is because they have lost so many gill nets and have caught so many fish that they hardly ever get in here now.--(LaBelle).

MISCELLANEOUS.

Chequamegon Bay.-- It is claimed that they have caught too many whitefish here,

but he thinks that the mills have done much of the damage by throwing in so much rubbish.- (Stranger).

MISCELLANEOUS.

Marquette.- Cause of decrease of whitefish simply from extensive fishing by gill nets, pound nets and everything combined.- (Grant).

POUNDS AND SEINES.

Marquette.- The whitefish would be benefited here by stopping seining. A $3/4$ inch mesh will catch very small fish. Pound nets are large enough mesh to let the medium size fish through, but seines will stop fish as small as your little finger. Fish weighing $1\ 1/2$ lbs. would run through the mesh they use in pounds.- (Goodwin).

YOUNG IN SEINES AND GILL NETS.

Marquette.- One of the most important questions of the cause of decrease here relates to the herring fishery with seines and possibly with gill ~~net~~s. Do the herring

nets take the young of the other species and in quantity to make it serious? We have heard nothing about the capture of young Lake Trout in the herring gill nets and there is probably no trouble on that score.

The young whitefish are said by several to be very abundant at times around the break-water and around the big wharves up to their inner ends. They are reported to be there during the summer. Parker, Grant and Goodwin, who do not engage in the small herring fishery, say they occur at times in these places in immense quantities. Hanson, who uses seines claims that they are never abundant, although he acknowledges their occurrence in the places mentioned. According to his statements he takes a few small whitefish in his seines, but never many. Others claim that a good many are so taken and sold as herring, and that formerly the quantity so taken was greater, sometimes immense when the species was more abundant.

Seining is claimed by some to have been one of the chief causes of the decrease of the whitefish, certainly if large numbers of

small whitefish are caught in the seines, seining should be prohibited where they occur or so restricted as to prevent their capture. But how can they be restricted? The herring are within reach of the seines during a comparatively short period only, principally the summer, when the whitefish are said to be with them. They only seine at such times as the herring are about the breakwater and the wharves.

When they leave these places and go further off shore they employ the fine meshed gill nets. I could get no satisfactory information to show that the young whitefish are taken in the herring gill nets, although they may be.

The seining at Marquette is on a very small scale. The nets are short and not over 4 in use altogether.--(Rathbun).

SEINES AND POUNDS.

Marquette.-- They say that the young whitefish, down to a very small size, occur by the wharves, especially during the summer and that these young are taken in the seines

and in the pounds in large numbers. These statements were given me by everyone who does not handle pounds and seines and they were disposed to lay a very great share of the decrease to this cause. None of the pound and seine men will acknowledge this, however, but say they take only an occasional small whitefish.-(Rathbun).

SMALL WHITEFISH IN SEINES.

Whitefish Point.- Occasionally in hauling for herring we would get some small whitefish. Thinks he could get them mixed in with the herring now. They would be in about 10 or 12 feet of water. There is a stream at No. 9 Life Saving Station and around the mouth of that stream is a great place for small fish. Thinks young whitefish and herring would be found there.-(Clarke).

MISCELLANEOUS.

Whitefish Point.- If you can get any one to tell you what has been the cause of the decrease of the whitefish they can do better than I. The fish have been caught

off and that is all you can say about it.-
(Endress).

SMALL FISH IN NETS.

Whitefish Point.- Does not know any particular line of fishing that would be more apt to catch off the fish than another. There is no use of talking, but that years ago when fish were plentiful there were a great many small fish uselessly caught and thrown away. We have done that ourselves, but now that they are getting scarce we are more careful.-(Endress)

SMALL IN SEINES.

Whitefish Point.- Never saw any small whitefish about here, the smallest having been from the seine at the point. They pulled a couple ashore there about 4 or 5 inches long.-(Pratt).

While I was at the point I saw a tub about half full of herring and small whitefish from the seine, still standing on the beach. They consisted mostly of herring, ranging mainly from 11 to 13 1/2 inches long, rather large for lake Superior. The largest white-

fish were 12 to 13 inches long, the smallest were 8 and 9 inches long. The 2 smallest were preserved in alcohol, and sent to Washington, and also one of the medium sized.--(Rathbun).

We never used to get any small whitefish in the gill nets and not many small ones in the seines. Would not get any small ones except in the August run with the herring and they would weigh from 1/2 to 1 1/2 lbs. apiece. We never used to market any of those little ones.--(Roach).

There were lots of young whitefish. Has hauled a little seine to catch bait for trout when we would get all young whitefish about 6 or 8 inches long; never saw any smaller than those and the seine would not stop anything smaller. A person can tell pretty well what the species was as they would be either whitefish or herring.--(Roach).

MISCELLANEOUS.

St. Mary's River.-- The fishermen account for the decrease by the increase in the number of boats passing through here and the stirring up of the water by the vessels, deepening the

channel for the government. Pound nets have not been fished extensively in the river for 3 years. The decrease of the whitefish began before that, but at that time fishing became unprofitable. He thinks it is due to the constant passing of vessels, not to over-fishing at all.--(Ainsworth).

SMALL FISH.

North Shore.-- He saw whitefish down on the north shore about 2 weeks ago that it took 75 whitefish to make 100 lbs., dressed.--(Elliott).

MISCELLANEOUS.

Port Arthur.-- The cause of the decrease is that they must have been caught off. I don't know of anything else.--(Trombley).

WHITEFISH---LAKE SUPERIORCAUSE OF DECREASE.

Port Arthur.---Both gill nets and pounds.

Large numbers taken from the water, and frightened away by twine and offal; more the latter than the former possibly (Trombley).

Does not know unless they are caught out (Servais).

Does not know unless it be the destruction of small fry by certain apparatus, notably pounds (Murray).

As many as 2 tons of young whitefish have been taken from a single pound at one lift (Trombley).

The cause of decrease must be that they have been caught off (Trombley).

General.---Has seen tons and tons of little whitefish thrown out upon the sand and buried. Has considered they were killing the goose that laid the golden egg (Kalmbach, 5).

Wisconsin.---Thinks too much pound netting was one cause. Some think it was on account of commerce, too much blasting on north shore, etc.

The whitefish come in to spawn on the south shore and would be taken in the gill nets, but seldom in the pounds as they were rarely set in November. Never were sufficient taken in the pounds during the spawning season to have depleted them.

Thinks the pounds were not especially responsible, because the whitefish stopped all of a sudden 10 or 12 years ago (Cooley, p.6).

Wisconsin.---Seining along the south shore has done harm to whitefish in the past, but last season was about the last they did seining to amount to anything. They employed them there in the spring and in the fall during the spawning season. Hauled over the spawning grounds. Two or three falls ago there were a good many seines between Wisconsin Entry and Bayfield. They would take whitefish into

market that were too small to be marketable, and they would make them salt them. The fishermen wanted to sell them fresh. They kept on hauling the seines anticipating getting larger fish, but they always got the same, and because they could not sell them fresh, they dumped them on the shore. That discouraged the men seining on the south shore. Last year and the year before we got quite a few from the seines, and they seemed to be pretty good sized at the beginning, but along toward the end they got small again, running from $\frac{1}{4}$ to $\frac{1}{2}$ lb. each. This spring (1894) no seines were put in there. There has been no fall seining for whitefish since they got such a bite 3 years ago. Three years ago they dumped hundreds of tons of small whitefish on the beach (Coventry).

West End.---They have had so many pound nets and seines going that they have simply cleaned the whitefish out. There are not as many pounds now as formerly because they cannot

get enough fish to pay them (E. S. Smith).

West End.---Never be able to raise the stock again unless there is a stop put to cleaning them every year with seines and pounds (E. S. Smith).

West End.---Thinks they used to spawn up streams and bays, which are now unfitted for them (Kalmbach).

West End.---Cause of decrease due to so many being taken during the spawning season, etc. (Flynn).

Bayfield.---The small fish are caught mostly along the main shore. The island pound net fishing as a rule is always large fish. We try to prevent catching small fish as much as possible and refuse to take them fresh. The smallest sizes which are salted are about 8 inches long and are called "medium 3's" (Johnson).

Bayfield.---The only causes he knows of for the decrease of whitefish are the seines and pounds. Seining is bound to be destruc-

tive to the small fish (Chafe).

Bayfield.---Whitefish do not spawn in water so shallow as that in which they seine. Spawning whitefish are seldom taken in the pound nets, the water in which they are set being too shallow for them at that time. The spawning whitefish that are taken are mostly captured in the gill nets (Draglund).

Bayfield.---Quantities of young taken by seines and small meshed pounds (Draglund).

Sand Island.---Thinks cause of apparent decrease is due, not to the number of fish taken, but to the decrease in food caused by the logging business. The great amount of saw dust and bark thrown into the lake has covered the food of the fish so that they have been obliged to change their grounds. The heavier the logging the lighter the catch of fish. Young fish are only taken in pound nets and fine meshed seines (Shaw).

Apostle Islands.---Catching out great numbers, but more especially to the logging business, sawdust and bark (Jas. Smith).

Bayfield.---They have lost so many gill nets and caught so many whitefish that they hardly ever come in here now (LaBelle).

Chequamegon Bay.---Putting in of the breakwater, which disturbed the fish (LaBelle).

Bayfield and vicinity.---The gill nets take a good many spawning fish (LaBelle).

Houghton.---Use of too small mesh, and use of seines the mesh of which goes as low as 1 1/2 inches (Croze).

Bete Grise.---Too many fish are taken; catching of spawning fish in the fall (Berriault)

Marquette.---Pounds beyond question have been destructive in certain places by catching so many small fishes. In some places 2/3 of them would be under proper sizes (Grant).

Marquette.---The cause of decrease is simply from extensive fishing by gill nets, pound nets and everything combined.

There are any amount of very small whitefish around the docks here at certain times. They come in here in the spring, following the

herring, but not mixed in with the regular schools of herring. They catch the small whitefish and sell them at the same price of the herring, and as herring. He sees these small whitefish in the month of May and until about June 15. They are plentiful around the docks (Grant).

Marquette.---Is pretty well persuaded that if the tugs had not commenced to fish out of here the fishing would have been good for 50 years (Goodwin).

Marquette.---The sawdust never hurt the whitefish spawning grounds around here because there are no spawning grounds in this vicinity that he has ever found.

The whitefish would be benefitted here by stopping the seining. A $3/4$ inch mesh will catch every small fish. Pound nets are large enough mesh to let the medium size fish through but seines will stop fish as small as your little finger (Goodwin).

Marquette.---Does not know unless the fishermen have cleaned them out. Has been too much fishing. The decrease began when the tugs came here. Threw the offal overboard (Anderson).

Marquette.---The smaller fishermen lay all the decrease to extensive tug fishing. The tug men, besides speaking against seines and pounds, consider that the number of tugs which came here from elsewhere a few years ago were responsible for the trouble. Goodwin, however, lays it to tugs in general, and says it would have been better had they all continued to fish with sail boats and small rigs (Rathbun).

Marquette.---One of the most important causes assigned relates to the catching of young whitefish in connection with the herring in the seines and herring gill nets. If young whitefish are taken in company with the herring the question arises as to whether the quantity is sufficient to be considered serious.

Parker, Grant and Goodwin, who do not engage in the summer herring fishery, say that the young whitefish occur around the wharves and breakwater in immense quantities during the late spring and summer. Hanson, who uses seines, while he acknowledges that he takes a few small whitefish at times, also asserts that they are never abundant. Others also inform me that a good many young whitefish are taken and sold as herring and that formerly the quantity so taken was much greater when the whitefish were more abundant. This method of fishing is claimed by some to have been one of the chief causes of decrease of the whitefish. I could get no satisfactory information to show that young whitefish are taken in the herring gill nets.

The seining at Marquette is on a very small scale, not over 4 nets are used and they are short. From my examination of the catch of these seines I was unable to find any specimens of whitefish among the herring.

Young whitefish, it was also asserted, are taken in the pound nets.

It is said that whitefish come in close to shore here to spawn, but comparatively little fishing is done in this region during November (Rathbun).

Whitefish Point.---Occasionally in hauling for herring with a seine he would get some small whitefish.

No fishing is done on the spawning grounds in November on account of the weather.

It was his impression at first that the fish were shifting to the other side of the lake and that they would get them again after a while (Clark).

Whitefish Point.---Too much fishing. Nothing will kill a fishing ground quicker than a tug. Will fish when the fish are spawning, etc. The seining does not amount to enough to do any harm (Pratt).

Whitefish Point.---The smallest he ever saw about here were in the seine. They pulled

a couple ashore about 4 or 5 inches long(Pratt)

Whitefish Point.---Take no spawning whitefish in the pounds except an occasional one.

If you can get anyone to tell you what has been the cause of the decrease they can do better than I. The fish have been caught off and that is all you can say of it. Does not know of any particular line of fishing that would be more apt to catch the fish off than another.

There is no use of talking but that years ago when fish were plentiful there were a great many small ones uselessly caught and thrown away. We have done that ourselves, but now that they are getting scarce we are more careful (Endress).

Whitefish Point.---From seine saw about 1/2 tub of herring and small whitefish, mostly former. The whitefish ranged from 8 to 13 inches (Rathbun).

Whitefish Bay.---Fishing so many gill nets and pounds. Pounds and seines destroy too many small fish. Pounds probably more destructive than any other method. Ninety miles of gill netting is too much for one company (Roach).

Whitefish Bay.---Did not get many small ones in the seine except in the August run, with the herring. They would weigh from $1/2$ to $1\ 1/2$ lbs. Have hauled a little seine to get bait when we would get all young whitefish about 6 or 8 inches long (Roach).

St. Mary's River.---The dredging has spoiled the fishing in the rapids (Roach).

Because it is just like everything else when you overdo it. Sometimes there are so many scoops out there that the fish cannot get around them (Ganley).

Increase in traffic; operations of dredging, etc. Not due to overfishing (Ainsworth).

North Shore.---Find that in places where they fish too much twine it drives the fish off, and while it does not catch them all out it drives them away (Ganley).

CAUSE OF DECREASE OF WHITEFISH - LAKE SUPERIOR.

St. Mary's River. - The dredges on the Government work have spoiled the fishing in the rapids. - (Roach).

DESTRUCTION OF YOUNG WHITEFISH--LAKE SUPERIOR

(See also under **Size and Mesh**).

West End.---Has seen tons and tons of little whitefish thrown out upon the sand and buried. Has considered they were killing the goose that laid the golden egg. The fishermen think they are only going to fish 1 or 2 years, just long enough to make some money, and then they are going to quit and they do not care what may happen to the fisheries after that (Kalmbach).

CAUSE OF DECREASE OF LAKE TROUT.

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LAKE TROUT--CAUSE OF DECREASE--LAKE SUPERIOR.

West End.---Thinks the trout, together with other species, used to ascend streams, etc., which are now closed against them or unsuited for their spawning (Kalmbach).

West End.---About the trout it is pretty hard to say. Does not understand them. They are a slower growing, and probably more eggs destroyed than with other kinds (E.S.Smith)

Isle Royale.---He thinks on account of so many being taken from the water during the spawning season, the spawn not being cared for (Flynn).

Isle Royale.---The reason they decreased is that pound nets were formerly set there (Johns).

Apostle Islands.---Due to catching out great numbers of fish, but more especially to the logging business; the distribution over the bottom of the lake of saw dust and bark (James Smith).

Bayfield.---Catching them in the spawning season (Chafe).

Bayfield.---The gill nets take a good many spawning fish because they are fished in the spawning season. The tugs have run the fish off more than the pound nets (LaBelle).

Houghton.---Would attribute the present scarcity to the use of too small mesh, and of seines (Croze).

Bete Grise.---Too many fish are taken. Catching of the spawning fish in the fall largely responsible (Berriault).

Portage Entry.---Can give no cause unless it be increase of pound nets (Quinn).

Marquette.---Does not know that the pounds catch smaller trout than the gill nets. The pounds catch a few more trout early in the spring than anything else. In the fall they would also get a run of trout (Grant).

Marquette.---Is pretty well persuaded that if the tugs had not commenced to fish out of here the fishing would have been good for 50 years. The sail boats use only about $\frac{1}{3}$ as much twine as the tugs (Goodwin).

Marquette.---Many trout are taken in the pound nets here. If the pound nets are kept in through October will get some spawning trout. Does not know what has caused the decrease unless the fishermen have cleaned them all out. Thinks there has been too much fishing here. Decrease began when the tugs came here and would throw their offal overboard (Anderson).

Marquette.---The smaller fishermen lay the decrease of both whitefish and trout to the extensive tug fishing. The tug men, besides what they say against seines and pounds, consider that the several tugs which came here from elsewhere a few years ago were responsible for the trouble. Goodwin, however, lays it to tugs in general and says it would have been better had they all continued to fish with sail boats and small rigs (Rathbun).

Marquette.---Are not taken extensively in the pounds, and rarely ever in the seines. There can have been but one cause for their decrease in general--gill nets (Rathbun).

Whitefish Point.---The only thing he knows is too much fishing. Nothing will kill a fishing ground quicker than a tug. A tug will fish in 3 or 4 fathoms in the fall when the fish are spawning (Pratt).

Whitefish Bay.---From so much fishing; so many gill nets, and so many pound nets. Pound nets destroy too many small fish and are probably more destructive than other methods. Seines destroy small fish also (Roach).

North Shore.---They find that in places where they fish too much twine it drives the fish off; and while it does not catch them all out it drives them away (Ganley).

North Shore.---They do not know whether it is the nets which keep the fish out or whether the fish have actually decreased and are given time to increase again by propagation (Rathbun).

LAKE TROUT--CAUSE OF DECREASE--LAKE SUPERIOR.

Bayfield.---The cause of the decrease of trout is catching them in the spawning season (Chafe).

Marquette.---They are not taken extensively in the pounds and rarely ever in the seines. There can have been but one cause for their decrease in general, namely, gill net fishing (Rathbun).

CATCH OF SMALL FISH.

RELATIVE DESTRUCTIVENESS OF POUNDS AND
GILL NETS WITH RESPECT TO YOUNG FISH--
LAKE SUPERIOR.

Duluth. Pounds probably waste the most
young fish. (Kalmbach).

Pounds more harmful by catching smaller
fish. We had to sort the pound net fish.
Did not market whitefish under 1 pound, but
caught many under that size. Would get
large quantities averaging about 1/2 pound.
No small whitefish are taken in gill nets.
(Cooley).

Greatest number of undersized fish taken
in the pounds. (E.S.Smith).

Isle Royale. Pounds clear out all the
fish. (Johns).

Bayfield. If there are little fish in
the pounds they will catch them; is some
like seine fishing. Gills least harmful;
can regulate the mesh so that the small fish

can escape. (Chafe).

Apostle Islands. Gill nets do not take or destroy young fish as do the pounds, and thus are not nearly so detrimental. (Swannes).

Sand Island. Pounds take smaller fish and in greater numbers than gills, but thinks pounds the proper method now, as the mesh has been regulated and do not take spawners. (Shaw).

Apostle Islands. Pounds much more detrimental since they take many more young fish and really save all that enter; especially true of whitefish. (Jas. Smith).

Bayfield. The only way the pounds used to destroy fish was by catching the little ones, when they used the small mesh. Otherwise gill nets are most harmful by catching spawners, &c. (La Belle).

Houghton. Is favorable to pound fishing

if the mesh is large enough, but, as it is, possibly destroys more young fish than any other method. The gill nets take the smallest number of small fish. (Croze).

Keweenaw. Gill nets not so destructive as pounds, as they take the fewest number of small fish, and with a properly regulated mesh no harm will come from their use. (Teddy).

Montreal River. More young fish are taken with the gills than with the pounds. (Berriault).

Portage Entry. Pounds do more damage than any other netting; gill netting much fairer both for fish and fishermen in general. (Quinn).

Grand Marais. Pounds more detrimental than gills, especially while the laws concerning the mesh and the fish taken remain as they are. (Connable).

Marquette. Does not know that the pounds catch smaller trout than gills, but they catch whitefish less than 1 pound, which are salted and used. No question but pounds have been destructive in some places by catching so many small fish. (Grant).

Whitefish Point. Gills take less small fish than pounds. In the latter get more small ones mixed in with the large ones. (Endress).

Pounds worse than gills in causing decrease of whitefish. Catch more small fish. (Shaver).

Pounds destroy too many small fish, and probably more destructive than any other method. (Roach).

Whitefish Bay. Do not get near as many small fish in the gills as in the pounds. (Johnson).

General. Too many small fish are taken

by the pounds. Thinks the pounds have done most damage in decreasing fish. The pound mesh in Michigan is still too small. 4-inch would be best. (Coates).

General. Thinks if the mesh is proper size, and they have proper restrictions to keep fishermen from taking too small fish, that pounds do the least harm. If the mesh is 4 inches, and the close season observed, pounds would do less damage than gills.

The pounds now catch more young fish than the gills, but with a 4-inch mesh does not think they would. Down east they have been very destructive to whitefish. One man said he saw 22 barrels of the young going through the gut pile one morning. (Elliott).

Port Arthur. Pounds take more young fish than gills. (Trombley).

Most small fish are caught in pounds. (Servais).

Gill nets take the greatest number of small fish. (Brunson).

Pounds take the greatest number of small fish, and has known them to gill as many as 100 at a time. (Davis).

Pounds take more small fish than gills, but these are easily released alive. (Maloney).

RELATIVE SIZE OF FISH TAKEN IN POUNDS
AND GILL NETS; CATCH OF SMALL FISH--
LAKE SUPERIOR.

Whitefish Bay. The smallest fish taken in the gill nets will not be as large as the smallest taken in the pounds. Do not get nearly as many small fish in the gill nets as in the pounds. With the exception of small trout, which will get caught by the teeth, they do not get many small fish in the gill nets. As a rule, the gill nets catch nothing but large fish. The average size of whitefish in the gill nets would not run larger than in the pounds. The average would be about 1 1/2 pounds. Pound net fish are more even than gill net fish; nearly all of a size. (Johnson).

Port Arthur. The sizes of fish caught in the gill nets differ but little from those

caught in pounds, except that they do not take as many large trout and as many young fish. Whitefish average about 2 1/2 pounds, trout possibly 6 to 7 pounds. (Trombley).

Pound nets take more small fish than the gills, but these can be dipped out without permanent injury. The pound is supposed to hold every thing that enters it. (Trombley).

Most small fish are caught in the pounds. (Servais).

As to average size of whitefish taken in gill and pound nets there would be very little difference. No doubt more small fish taken in gill nets. The trout average about the same. (Brunson).

The average size of fish caught with gill nets is somewhat larger than those taken with pounds, seldom taking one smaller than 1 1/2 pounds. (Maloney).

There are no fish taken in gill nets too

small for market; hence the only waste fishes are suckers. These are taken in greatest abundance about last of July. The gill net does not take as many small fish as the pounds. (Maloney).

CATCH OF SMALL FISH---LAKE SUPERIOR.

GENERAL.

Bayfield.---Could offer no theory for the great decrease of fish on the south shore except that quantities of young were taken by seines and small mesh pound nets (Draglund).

Bete Grise.---Very few young fish were taken, and these late in the fall. Would attribute the present scarcity to the use of too small mesh and the use of seines, the mesh of which goes as low as 1 1/2 inches (Croze).

Portage Entry.---Concerning the abundance of small fish taken during any part of the year Mr. Quinn is unable to say, but thought that the middle of July or first of August was possibly the time when the smallest whitefish were taken (Quinn).

Grand Marais.---No fishes are taken too small for market. Small fish are sometimes salted, but no young fish are taken in pound nets during the early spring run of whitefish. These do not appear until later in the summer, and no young fish are taken in gill nets (Connable).

Whitefish Point.---Thinks pound nets destroy too many small fish, and that probably they are more destructive than other methods, but the seines destroy small fish also. There has been an immense quantity of young whitefish destroyed in the seines. The mesh now, if they make it according to the size required by law, ought not to destroy too many small fish. When that law was passed, however, there were lots of fishermen who had their nets made, many of them old ones and some new ones, and they would not change anything, but kept right on fishing those old nets, and some of them are fishing them today (Roach).

Port Arthur.---Does not think there has been 50 lbs. of small fish taken this year (Nuttall).

POUND NETS; CATCH OF SMALL FISH---LAKE SUPERIOR.

Wisconsin.---This season there were a lot of pounds down at Amnicon River about 10 miles from Superior, and they started in with pretty good sized whitefish and some wall-eyed pike and a few sturgeon, but I noticed that the whitefish began to get small again and I told our captain that he must not accept any whitefish that would not make 1 lb. dressed. That brought the fisherman up, and he said it is pretty tough as they were not getting anything but the small ones, but he expected the larger ones would soon come in again. He had hardly gotten back before another batch of these small whitefish came up. I stopped^{it} again and the fisherman came up again. I told him we did not want any whitefish that would weigh less than 1 lb. dressed; to salt them if he pleased and we would endeavor to sell them on commission; but we could not pay for them until they were sold (Coventry).

Wisconsin.---The under sized fish they take are put in the dump pile; some bury them and

some just throw them away in some out of the way place. Has seen tons and tons of nice little whitefish wasted in this way. Has seen whitefish as small as 4 or 5 inches long. The only place he sees them is where they haul the seines and pound nets (E. S. Smith).

Apostle Islands.---Says that all pound nets catch small fish weighing as little as $1/2$ lb. Says this is especially true in the large lifts where many fish are taken. That the larger fish go to the bottom and that few if any of the fishermen allow the small fish to escape, but that they are salted as small as $1/4$ lb. (Swannes)

Marquette.---They catch lots of small whitefish in the pound nets. They get what they call big runs. He has fished a pound net up at Big Bay, and was up there early one season and in the spring, as soon as they got the net in they got a run of medium sized whitefish. Along in August a run of those small whitefish came that went in the lead and gilled all through the pot and they were of no use, as we could not market them, but still they were gilled and destroyed (Grant).

Thinks the pound nets here are not so injurious to the whitefish because where the small whitefish congregate is right here in the harbor where they cannot set pound nets. There are lots of small whitefish go in Big Bay and around Grand Island (Grant).

Marquette.---At Grand Island some years ago they used to catch some very small whitefish in the small mesh nets, just about as small as they could be, and any amount of them. Around here we have never fished such small mesh nets as they have down there. Down there the pound nets have been responsible for the decrease of the whitefish by catching so many small ones. It was 15 or 16 years ago that they were taking those small ones. He has not been down there for 11 or 13 years and does not know how it is there now. They would dip them out of their nets and let them go, and would bury them, and everything. It was a place where you could get all the fish you wanted (Goodwin).

Whitefish Point.---Years ago I used to see quantities of fish brought ashore that were too small for dressing or other purposes. They were taken in pound nets (Clark).

We very seldom get small whitefish in the pounds. The small ones would get through(Clark)

Whitefish Point.---When they catch large quantities of fish in a pound they cannot help securing some small fish which would escape through the mesh if the catch was small(Shaver).

Whitefish Bay.---When they commenced this spring they began sending down some small fish, and out of the first lot I received I must have culled 700 or 800 lbs. of small fish. I told them we would not take the fish from them if they brought that class of fish (Ainsworth).

Port Arthur.---There are comparatively few young fish of any species taken, but the greatest number seem to appear in the spring of the year (Brunson).

CATCH OF SMALL FISH---LAKE SUPERIOR.
POUNDS.

Sand Island.---Whitefish as small as $1\frac{1}{2}$ lb. are taken in pound nets. The smallest trout are about the same size. The young trout and whitefish are both taken and are most numerous in June and the early part of July (Shaw).

The young trout are more abundant in the spring than fall and the young whitefish are most abundant in July (Shaw).

Marquette.---Does not know that the pounds catch smaller trout than the gill nets, but they catch whitefish less than 1 lb., and those are salted and used. There is no question but that the pound nets have been destructive in certain places by catching so many small fish. There are shores where they would not get those small fish and in other places $\frac{2}{3}$ of the catch would be under proper size (Grant).

Port Arthur.---The young whitefish and trout are taken, but more of the former, and during the spring of the year as many as 2 tons of young fish have been taken from a single pound net at one lift. These are generally

taken from the nets in shallow water on a sandy bottom (Trombley).

Port Arthur.---The young of both trout and whitefish are taken in the pounds, but only rarely. The nets are set at the very edge of deep water, and knows but few young are taken. The young that are taken occur during the run of older ones (Nuttall).

Port Arthur.---Could assign no reason for the great decrease of fishes unless it may be the destruction of small fry by certain apparatus, notably pound nets (Murray).

POUNDS; CATCH SMALL FISH--LAKE SUPERIOR.

East End. Thinks too many small fish are taken by the pounds. This used to occur much more than at present. Used to employ a mesh in the pots of only about 1/2-inch bar. Nothing could get through. The mesh in Michigan is still too small. Thinks the pounds have done the most harm in decreasing fish. A 4-inch mesh would be the best for the pot. The big fishermen, like Endress, would not like it, but he thinks, from what he saw, that 2/3 of their catch of whitefish in 1893 had not reached mature size. (Coates).

East End. The pound nets now catch more young fish than the gill nets; but with a 4-inch mesh do not think they would. Very few pounds have been really 4-inch. I have only about 18 pounds on Lake Superior, but where they have been used down east here (probably

refers to North Channel) they have been very destructive to whitefish. One man said he saw 22 barrels of young whitefish going through what they call the gut pile in one morning. They use only 1-inch bar. As a rule, the fishermen, when they lift their pounds, are in a hurry; they are hired by the month and have no interest. They just scoop every thing up, both large and small fish. (Elliott).

Port Arthur. Pounds are notably responsible for catching small fry, and, therefore, for the destruction of fish, especially whitefish. (Murray).

Pound nets take the greater number of small fish. (Maloney).

CATCH OF SMALL FISH---LAKE SUPERIOR.

GILL NETS.

Marquette.---Does not get many small white-fish or trout. His catches will average about like the catch he brought in today (Hanson)

GILL NETS AND YOUNG WHITEFISH - LAKE SUPERIOR.

Port Arthur.- In the herring gill nets took nothing but herring. Very seldom got any small whitefish. If the herring nets are used extensively does not think they would take very many young whitefish. Does not think whitefish spawn with the herring. I took notice last fall when they were fishing for herring and they got no young whitefish.- (Trombley).

HERRING GILL NETS; CATCH OF SMALL WHITEFISH.
LAKE SUPERIOR.

West End.- Could catch herring in large quantities all through this region and always more or less whitefish mixed up with them. Up along the North Shore and at Isle Royale they do not catch any whitefish in them. They do not do any harm to whitefish there, only catch enough to use for bait.-(Kalmbach).

Marquette.- He has never taken any whitefish large or small in his herring nets. Has heard Henry Anderson say that he had taken 2 or 3 some years ago.-(Lorntzson).

Marquette.- See special discussion under seines and under herring.-(Rathbun).

SEINES; DESTRUCTION OF SMALL FISH.

LAKE SUPERIOR.

Wisconsin.- Used to take small whitefish with seines in the winter right off Minnesota Point, on the Duluth side of the canal.-(Cooley).

See further under small whitefish.

Wisconsin.- Kept taking too many small whitefish, which we refused to buy. The fishermen became discouraged in the spring of 1893, and in the spring of 1894 not a seine was put in.-(Coventry).

Wisconsin.- Takes many undersized whitefish. Has seen tons and tons wasted. Considers it a very harmful method.-(E. S. Smith).

Bayfield.- Has heard there would be wagon loads of fish left on the beach that would be of no account. Has never seen anything of that himself, however. In Bark Bay and Siskawit, Wis. the shores would be just lined with fish they would throw away. This was before his time. It makes no difference what the size of mesh is; it closes

up when they pull the seine in. Seining should be prohibited.--(Johnson).

Bayfield.-- Some years they would get large whitefish, and other years they would be nearly all small. The year's general average as to size would be small. They would run some years as small as $1/4$ lb., but it would depend upon the size of the mesh. Some fish on purpose to catch the small fish and get a great many of them, but the dealers did not care for them. If there are plenty of big fish and little ones with them, you cannot help bringing the littles ones ashore in the seines.--(Chafe).

Seining is bound to be destructive to small fish. One of the chief causes of the decrease of whitefish.--(Chafe).

Wisconsin.-- His seines took nothing under 1 lb., the largest being 4 or 5 and the average size $2\ 1/2$ lbs. This, however, was not true of other seines, since a mesh was used sufficiently small to take young whitefish of $1/2$ to $3/4$ lb. in great numbers. Capt. Draglund and Wm. LeDue, fish packer on

the tug "Currie" both testified that tons of young whitefish were scooped and allowed to rot on the shores.--(Draglund).

Bayfield.-- Catch any amount of small whitefish. The seines caused a good deal of damage to the whitefish. Notwithstanding that the seines are small/ they kill a great many young whitefish, and they never dress 1/2 they get, they are so small. Thinks they have been chiefly responsible for the decrease of whitefish.--(LaBelle).

Bete Grise.-- Has fished seines, but does not believe in seine fishing as more small fish are caught and destroyed in this way than any other.--(Berriault).

West Side Keweenaw.-- No young game fish are taken, and but few young fish of any kind, except in the herring seines.--(Teddy).

Marquette.-- Can catch pretty small fish in the seines.--(Parker).

Marquette.-- In the old times they generally used pretty large mesh, and would not catch any of the small whitefish they get now.--(Grant).

Marquette.-- The seines take anything that is in them; small whitefish and herring. Has seen barrels of smallwhitefish from 4 inches up caught with the herring. Get them now right along. Yesterday morning saw 2 boat loads of herring come in, and feels sure there were whitefish among them. (I had examined these herring and found no whitefish - Rathbun). In around the docks is where the young whitefish are located, and when they haul a seine there is where they get them mostly. His opinion is that seines have destroyed the fishing here.--(Goodwin).

The herring are right along the beach, and sometimes they do not go out 4 rods with the seines; and the whitefish are with the herring sometimes, and occasionally they will catch $1/3$ or $1/2$ whitefish. The State plants whitefish fry here in the harbor, and as soon as they get large enough the seines pull them out. The whitefish would be benefitted here by stopping the seining. A $3/4$ inch mesh will take everything.--(Goodwin).

Marquette.- The seine fishing has not done any harm here. They do not kill young whitefish to amount to anything. In hauling around the docks, which they do sometimes, they will get a few young whitefish with the herring, when they seine outside they do not get any young whitefish. But 15 or 20 years ago they got plenty of both small and big whitefish. There are places here about the docks where you can seine and not catch a whitefish; and around one of the wharves you can get most all young whitefish. They get big ones as well as small ones. They get whitefish as small as the herring.-(Anderson).

Marquette.- Once in a while they get 1 or 2 small whitefish, sometimes get 3 or 4 dozen or more mullet in with the herring. The people generally do not know the difference between young whitefish and other fish, and they frequently claim that great quantities of whitefish are being taken in the seines when they are something else, and would be principally mullet.-(Lorntzson).

Marquette.- Sometimes get 1 or 2 young whitefish in the seines, but not many. Sometimes would see young whitefish around the breakwater, but never saw them around the wharves.--(Hanson).

Marquette.- One of the most important questions here relates to the herring fishery with seines and possibly with gill nets. Do the herring nets take the young of other species than the herring and in quantity to be considered serious? We have heard nothing about the capture of young lake trout in the herring nets and there is probably no trouble on that score.

The young whitefish are said by several to be very abundant at times around the breakwater and around the big wharves up to their inner ends. They are reported to be there during the summer. Parker, Grant and Goodwin who do not engage in the small herring fishery, say that they occur in those places at times in immense numbers. Hanson, who uses seines, claims that they are never abundant, although he acknowledges their occurrence in the places

mentioned. Hanson says he takes a few small whitefish in his seines, but never many.

The others claim that a good many are so taken and sold as herring, and that formerly the quantity so taken was greater, sometimes immense, when the species was more abundant.

This method of fishing is claimed by some to have been one of the chief causes of the decrease of the whitefish. Certainly, if large numbers of small whitefish are caught in the seines, seining should be prohibited where they occur, or so restricted as to prevent their capture. But how could they be restricted? The herring are within easy reach of the seines during a comparatively short season only, principally the summer, when the whitefish are said to be with them. They only seine at such times as the herring are about the breakwater and the wharves. When the herring leave those places and get further off shore they employ the fine meshed gill nets.-(Rathbun).

Examined two or three seines catches of herring very carefully and failed to find any young whitefish among them, and, in fact, anything but herring.-(Rathbun).

Whitefish Point.- In speaking of the fish which he used to obtain seining. Almost all would be No. 1 fish, might be a few No. 2, very seldom any as small as 1/2 lb. Occasionally in hauling for herring we would get some small whitefish. (See also under Whitefish, Abundance and Size).

I have seen whitefish here that would not be more than 4 inches long. There was a party fishing in the early part of the season with a 1 1/4 inch mesh and I saw him make a haul or 2 with it. I told him if I saw him hauling that seine again I would inform on him. He was hauling in small whitefish as well as herring, some of them would not be 4 inches long. That was up at Little Two Hearted River, 4 or 5 years ago. I made inquiry afterwards to know if he was up there yet, and they told me they would see after it. That was in the latter part of June.

He thinks small whitefish have been taken in the seines about here. The seines have a mesh large enough to let the little ones go through if they get in, with one or two exceptions. All the seines that they have used for fishing purposes have been large enough to let these small fish pass through. That is, fish that are too small for dressing. Years ago I saw quantities of fish brought ashore that were too small for dressing, or other purposes, but not from seines, they were from pound nets.

In the deep hole just inside of Whitefish Point he never saw many small whitefish taken in the seines. They were always a good marketable fish as far as he has noticed. There was nothing taken there with the seine during my time that was anything below the average size.

Thinks the seines would be all right in the mesh was large enough. A seine will not destroy as many small fish as pound nets.--
(Clark).

Whitefish Point.- Never used to get many small whitefish in the seines. I have hauled a little seine to catch bait for trout, when we would get all young whitefish about 6 or 8 inches long. Seines and pounds destroy the young fish. There has been an immense quantity of young whitefish destroyed in the seines. The mesh now required by law ought not to destroy too many small fish. Lots of people had their nets with smaller mesh and they have kept on fishing them.- (Roach).

Whitefish Point.- About 4 years ago they had a small mesh in the seines, smaller than the one they have now, and we reported that to the Fish Warden and he came up and cut the bag out of the seine and burned it. They then put in a larger sized mesh and they stopped catching the small fish, but they used to take a good many small fish. Does not think much of the seines on account of their getting too many small fish.--(Endress).

Whitefish Point.- Has not seen much of seining about here. Knows that they catch a smaller average size of whitefish than the pounds. They can do much harm.-(Shaver).

Whitefish Point.- The seining does not amount to enough to do any harm as to decreasing fish. You have to wait for the fish to come, the same as with pounds. The smallest whitefish he has seen about here were taken in the seines, had a couple 4 or 5 inches long.-(Pratt).

Whitefish Point.- In the spring you would probably get 1/2 No. 1 fish, that is over 1 1/2 lbs, dressed, and later they were smaller. Has never seen any very small whitefish around here. Some seasons the run seems to be smaller than others.-(Kimball).

Whitefish Point.- The following observations relate to the seine fished just inside of Whitefish Point. They had a tub about 1/2 full of herring and small whitefish still standing on the beach when I reached there. They were mostly herring which ranged large for Lake Superior, so far as my observations go, ranging mainly from 11 to 13 1/2 inches.

The largest whitefish were 12 to 13 inches long, the smallest 8 and 9 inches long. I have saved the two smallest in alcohol, also one of medium size.--(Rathbun).

Whitefish Bay.-- Cannot say that seines have done any particular damage on this shore. They catch all kinds of fish. Catch whitefish that would weigh $1/4$ lb. or less. He does not know whether the size of the mesh of the seines has been regulated. They have large seines here with about $1\frac{1}{2}$ to 2 inch mesh. If they would regulate the size to $3\frac{1}{2}$ inches, the same as the pound nets, he thinks it would save a great many small fish. Here they have a 4 inch mesh in the wings. He thinks the seines do a great deal of damage catching so many small fish.

I think that seines should be regulated to $3\frac{1}{2}$ inch mesh if not smaller, because they destroy more fish than either the gill nets or pounds. Seines are not used a great deal now because there is no use for them as they have caught off all the fish. Where there was good seining a few years ago there is none now.--(Johnson) -

CATCH OF YOUNG WHITEFISH IN HERRING SEINES.--
LAKE SUPERIOR.

Marquette.-- Examined the catch of herring from a seine brought in by Nels. Hanson, the quantity amounting to about $2/3$ or $3/4$ of a bbl. There were no other species than herring with the lot. Mr. Hanson supposed I had left Marquette before this time, and therefore had no reason to throw any young whitefish or other species away. The catch he brought in was probably just as it was made and was a very small one.--(Rathbun).

ASSOCIATION OF HERRING AND WHITEFISH--
LAKE SUPERIOR.

The seines, which were used during July mostly, took whitefish and herring. There are not many herring on the shore when the whitefish are thick. (Chafe, Bayfield).

Marquette. This is discussed under seines and small whitefish. I saw no whitefish mixed in with the herring, although I examined several catches. (Rathbun).

Whitefish Point. Found a few small whitefish mixed in with the herring seined at the Point. (Rathbun).

SEINES AND WHITEFISH --- LAKE SUPERIOR.

Whitefish Point.- We never used to get any small whitefish in the gill nets and not many small ones in the seines. Would not get any small except in this run in August with the herring, and they would weigh from 1/2 lb. to 1 1/2 lbs. apiece.

There were lots of young whitefish here. I have hauled a little seine to catch bait for trout, when we would get all young whitefish about 6 or 8 inches long. Never saw any smaller than those. The seine would not stop anything smaller than about 6 or 8 inches.- (Roach).

CAPTURE OF SMALL FISH --- LAKE SUPERIOR.

Port Arthur.- Does not think there has been 50 lbs. of small fish taken this year.-
(Nuttall).

CATCH OF SPAWNING FISH.

CATCH OF SPAWNING FISH---LAKE SUPERIOR.

GENERAL.

Minnesota.---They take spawning trout in the gill nets and would take scarcely any spawning whitefish. They take the spawning trout in the gill nets and in the pound nets at Grand Portage. That is one of the best places for collecting trout eggs for this station (Wires).

Isle Royale.---The cause of the decrease of fish he thinks is on account of so many being taken during the spawning season, the spawn not being cared for. You take it around Isle Royale the fishermen do not have much respect for spawn and they do not try to save the eggs (Flynn).

Bete Grise.---Spawning individuals of both whitefish and trout were taken; many more trout, however, than whitefish. Spawning trout were taken in October, but does not remember when the spawning whitefish were taken (Croze).

West side Keweenaw.---No spawning fish of either species have been taken by Mr. Teddy on this coast, but he has taken them in Traverse Bay (Teddy).

Bete Grise.---Spawning whitefish are caught in November and spawning trout in October, but he has never taken any as his nets are not left in so long (Berriault).

Portage Entry.---Both whitefish and trout are taken during the spawning season, but not in large quantities, this not being a regular or important spawning ground (Quinn).

Grand Marais.---No spawning fish are taken with pound nets because the fish are not there. Both spawning whitefish and trout are taken in gill nets later in the season (Connable).

Marquette.---They get a trout run in the fall. Do not get many whitefish in the pounds in the fall (Grant).

Whitefish Bay.---Off the mouth of Taquame-non River you can catch trout in 4 feet of water and they spawn out to 18 or 20 feet on the gravel bottom (Reach).

Port Arthur.---The most of the trout are taken from September 15 to November 1.

Herring are fished only from about November 10 to 20 (Nuttall).

Port Arthur.---Very few spawning fish of any kind are taken; none of whitefish and very few of trout. A few are taken in October, but pound nets are usually taken out of the water of the before the close\season. Besides there is a close season in November which is pretty well observed (Brunson).

Port Arthur.---Both trout and whitefish are taken while spawning. The trout spawn from October 1 to 15, and are through spawning before the close season begins. Possibly 10 or 12 per cent of the trout taken from October 1 to 15 are spawning. The whitefish spawn from October 15 to about November 10, and possibly 10 per cent of the whitefish taken from October 15 to November 1 contain ripe spawn (Nuttall).

Port Arthur.---Both whitefish and trout are taken spawning, but more of the latter since they are the first to spawn. During the heaviest of the run of trout possibly 15 or 20 fish out of every 100 contain ripe spawn (Maloney).

CAPTURE OF SPAWNING WHITEFISH IN NETS--
LAKE SUPERIOR.

Nets Generally.

Port Arthur. The principal catch of whitefish is when the fish come in to spawn. (Marks).

Port Arthur. Spawning individuals of the whitefish are taken in the nets. Does not know the exact time. (Davis).

Whitefish Point. Referring to the shallow banks off the shore near his place where whitefish are likely to spawn, he states that late in the fall you cannot get to them and they are perfectly safe. The chances are, if you set a net off there, you will never lift it on account of the storms and currents carrying it away. It is almost impossible to set nets in deeper water than they are in at present. (Clark).

Whitefish Point. When the whitefish come in close in shore in November to spawn they could be taken, but the fishing season has ended, no steamers are running, and there is no chance to market them. The weather is very cool and the nets would be liable to be blown out at any time. Gill net fishing on a small scale has been carried on for the large spawning whitefish. They are set right on the shore every year. Have to be carefully watched and taken up if the weather becomes bad. (Shaver).

Bayfield. Spawning whitefish are seldom taken in pound nets, these being set in from 12 to 40 feet of water, too shallow for the spawning whitefish. When taken in pound nets or in shallow water they are only there for the purpose of feeding. (Draglund).

Whitefish Point. Take only an occasional spawning whitefish in the pound nets, as the

spawners do not occur before November 1.

(Endress).

Whitefish Bay. We once had some pound nets in the southern part of Whitefish Bay late in November and December, but did not get any spawning whitefish worth speaking of. (Endress).

Whitefish Bay. Spawning whitefish are not taken in his nets where set at present. When he fished nets in Taquamenon Bay spawning whitefish were taken and Fix takes them there now. (Johnson).

Bayfield. Spawning whitefish are almost invariably taken in gill nets (not in pounds) and seldom in less than 12 fathoms of water. (Draglund).

SPAWNING WHITEFISH IN GILL NETS.

Marquette. According to his notes under Spawning Places, comparatively few spawning

whitefish would be taken in the gill nets fished out of Marquette. (Grant).

SEINES.

Bayfield. The whitefish do not come near enough to the shore, nor in water so shallow as that in which they seine. (Draglund).

Whitefish Point. During the time of his fishing with seines he would take a few spawning whitefish in them. But he also stated that whitefish did not come in generally in abundance on this shore during the spawning season on account of stormy weather. (Clark).

SCOOP NETS.

Soo. The fall dipping by the Indians is done during the spawning season in November and he thinks that the fish spawn in the river. Thinks, however, that more fish are

taken in the spring by the dip nets than in the fall. Never get any eggs there for the Alpena hatchery. The fishery is not carried on on a large enough scale. (Wires).

CATCH OF SPAWNING WHITEFISH BY NETS.

LAKE SUPERIOR.

Marquette.-- There is said to be comparatively little fishing about here during November and they doubt if they catch many spawning whitefish in consequence.--(Rathbun).

Port Arthur.-- The great proportion of spawning fish are taken in the gill nets, because at the time of spawning pound nets are taken out.--(Brunson).

POUND NETS; CATCH OF SPAWNING FISH--LAKE SUPERIOR

3 Minnesota.---Do not get any whitefish eggs from the pound nets at Grand Portage. He never catches any spawning whitefish there(Wires)

Wisconsin.---Spawning whitefish have not been taken very much by the pounds on the south shore on account of stormy weather. Never but once or twice to his knowledge have pound nets been set in the fall and they never made a success of it. There never were fish enough taken with pounds in the spawning season to have depleted the whitefish.

Isle Royale.---Has heard of their going down there and catching them in the pound nets, any amount of them when they come in there on the feeding grounds, and probably to spawn at the same time (Flynn).

3 Wisconsin.---During the spawning time whitefish come within a mile of the shore at Amnicon River and are taken in the pounds. The water is shoal at that place and the pounds reach out from 3/4 mile to 1 mile from shore (E. Smith).

Apostle Islands.---Do not take any spawning whitefish in pound nets here because they do not fish them here in the spawning season. They have tried to fish pound nets here in the fall, but were not successful (Johnson).

Grand Marais.---No spawning fish are taken with pound nets because the fish are not there (Connable).

Port Arthur.---In the bay whitefish will spawn out in 15 fathoms, out beyond the pound nets (Trombley).

CATCH OF SPAWNING FISH---LAKE SUPERIOR.

POUND NETS.

Sand Island.---No spawning trout and white-fish are taken in the pounds (Shaw).

Marquette.---In the fall if you keep the pound nets out through October you will get some spawning trout, but get no spawning white-fish unless you keep them out late into December (Anderson).

USE OF GILL NETS ON SPAWNING GROUNDS IN
SPAWNING SEASON--LAKE SUPERIOR.

Obtained very little information relating directly to this subject. See further under gill net seasons.

Bayfield. During November the gills are fished in this region, but the pounds are not. (Chafe).

Apostle Islands. Frequently takes trout containing spawn in gills after pound season is over. Very few spawning whitefish are taken. (Jas. Smith).

Whitefish Point. Gill netting on a small scale has been carried on for spawning fish. They are set right on the shore over night. Have to be carefully watched and taken up if the weather becomes bad. (Shaver).

Whitefish Bay. With gill nets take whitefish at the southern entrance to Taquamenon

Bay during the spawning season. They occur there abundantly from the middle of October to the middle of November. About the 1st November they are at their best for spawning and eggs were obtained there for the hatchery last fall. (Johnson).

Port Arthur. Both spawning whitefish and trout are taken in gill nets. (Trombley).

Catch spawning trout in the fall. (Brunson).

Wisconsin. In November we would come up off Wisconsin Point to get the whitefish when they were spawning. (Cooley).

The whitefish come in to spawn along the south shore and would be taken by the gill nets in the spawning season. The gill nets were set on the spawning grounds in the spawning season. (Cooley).

West End. They do not follow the fish much on the spawning grounds. (Coventry).

CATCH OF SPAWNING FISH---LAKE SUPERIOR.

GILL NETS.

Minnesota.---In October (some 20 years ago) we used to go down on the north shore as soon as the trout commenced to spawn, anywhere off Lester River, and off opposite London. We used to get big fishing for trout (Cooley).

Wisconsin.---In the fall they have a distinct season for whitefish. When the whitefish are spawning they get very few trout. When they are working up the shore they will get all trout and then all whitefish, and later on about the latter part of November, they will get all herring (Coventry).

Bayfield.---The only time we get whitefish in the gill nets is in the fall (Johnson).

Bayfield.---October and November are the spawning months for the trout. They do not get many spawning whitefish here in the gill nets. He has been working here in the house (A. Booth Company) for 4 years and does not see any spawning whitefish taken. They get a good many spawning trout, however (Chafe).

Apostle Islands.---Frequently takes trout that contain spawn. This is done with gill nets which he employs after the pound net season is over and the fish have gone to deep water. Very few spawning whitefish, however, are taken (James Smith).

Marquette.---Gets trout with ripe spawn in the fall about the middle of October, and thinks they start spawning in September. Gets them on the north side of Presque Isle. They are the most abundant the last of October.

They fish herring during the spawning season and also fish for whitefish and trout during the spawning season (Hanson).

Whitefish Point.---They do not get any spawning fish from the gill nets in the fall. They get very few trout then, however (Endress).

SEINES; CATCH OF SPAWNING FISH - LAKE SUPERIOR.

Wisconsin.- He don't remember ever having taken any fish, in the seines, that were spawning.- (Draglund).

Sand Island.- The seines are never hauled over the spawning grounds of any game fish, nor are they hauled over the spawning grounds of trout or whitefish.

West Side Keweenaw.- Seines are not hauled over the spawning grounds of any fish as the fish do not spawn on this coast.

CATCH OF POUND NETS.

POUND NETS; CATCH---LAKE SUPERIOR.

General.---Do not take many waste fishes in pounds on Lake Superior as compared with Lake Erie (Wires).

Isle Royale.---There were formerly 1 or 2 pounds set up in the bays there, but they caught mostly large whitefish; also took wall-eyed pike (Cooley).

Minnesota.---They catch about all lake trout along the Minnesota shore. In the pound nets at Grand Portage get an occasional whitefish. Presumes they catch some herring there in the fall. Along until the ^{regular} ~~xxx~~ trout run comes on they probably catch from 1/4 to 1/3 whitefish, but catch nothing else except a very few herring. Of course they get a few suckers, etc., and an occasional sturgeon, but not many (Wires).

They catch whitefish and trout in the pound nets at Grand Portage, and presumes now and then they would catch an odd pike (Flynn).

Wisconsin.---The fish they take principally with pound nets on the south shore is whitefish. Their season for whitefish opens about the 10th of May, from the 1st to the 10th. The first fish they would take would probably be trout for a week or so (Kalmbach).

In the pound nets close in along the south shore near Superior they get pike perch. Do not get so many of this species after they get 15 or 20 miles below here. Down there they do not usually get anything but whitefish and a few trout mixed with them. They get herring, however. The herring they can catch in May and June sometimes. Then in the fall they get herring along the shore (Kalmbach).

Besides whitefish, trout, siscowet and herring, never took any other fish to any extent except in the fall. They used to get a few wall-eyed pike, a few sturgeon, etc. (Cooley).

All kinds of fish are much less abundant than they were 4 years ago; not $\frac{1}{2}$ as many taken this year as last. Not many lake trout on this shore, mostly whitefish. Take very few trout in the pounds. Do not take $\frac{1}{3}$ as much wall-eyed pike as whitefish; the catch would consist $\frac{2}{3}$ of whitefish. He has not obtained

1 lb. of fish from any of these pounds for about one week (E. Smith).

Bayfield region.---They catch in the pound nets both whitefish and trout. The trout run comes first and the whitefish follows. The trout last about a week and the whitefish come in and continue into the summer, but get a few trout with the whitefish. A certain fisherman at Sand River has not gotten any whitefish yet this season. Has caught more trout this season than ever before (Johnson).

In the catch brought in last night had more trout than whitefish. Taking the catch of the Presque Isle pound nets this year, it has been mainly trout, but they have brought in 2 or 3 very nice batches of whitefish. Last week they caught 2 or 3 tons of very nice whitefish. The whitefish that came in today were from the main shore and Rice Island; they were large and fine (Johnson).

Sand Island.---The market fishes taken in the pound nets are whitefish and trout. A few suckers, wall-eyed pike and sturgeon are also taken. The first fish to appear in the spring is the trout; frequently also the last in the fall. Trout and pike are taken more or less

the entire season and are taken more or less together in one net. When there is a good run of whitefish, however, no trout are taken. Again when there is an extra heavy run of trout few or no whitefish are taken (Shaw).

Apostle Islands.---Only 2 species of fish are caught for market in the pounds at Rice Island, trout and whitefish (James Smith).

Bayfield.---In his pound nets gets whitefish in the first place and continues to take whitefish with once in a while some trout. Does not get many trout, depending mostly upon whitefish.

Last year he paid \$160 personal tax and did not catch any fish at all (LaBelle).

Chequamegon Bay.---In the pound nets on the south shore of the bay they take mostly whitefish, with some wall-eyed pike and some sturgeon. In the fall they catch quite a few cisco (Mathson).

In the pounds on the south side of the bay they catch whitefish as soon as the ice serves. This year it began the last of April and continued until about July 1, when they began to grow less. This spring Mr. Ashland took one lift of 1,450 lbs. of whitefish. For wall-eyed pike and cisco see under separate heading (Rathbun).

Bete Grise.---The market fishes taken in the pounds were whitefish and trout. Never took pike or sturgeon. We never fish for herring. No waste fishes were taken in these nets since all could be utilized as salt fish (Croze).

Trout and whitefish are the market fishes taken. Occasionally lawyers and suckers are caught and sometimes a sturgeon, perhaps 2 or 3 of the latter during the season. The most white young fish are taken in August; the first ones are large (Berriault).

Portage Entry.---About the only market fishes taken in the pounds at present are lake trout and whitefish, and also herring during a short season. Occasionally a few brook trout are caught (Quinn).

Marquette.---They used to catch some of the big humpbacks in the pound nets occasionally. Has seen them caught in pounds this season that would weigh 12 or 15 lbs., but very scarce to what they were (Grant).

The principal catch of pound nets in this region has been whitefish, and also trout (Goodwin).

Marquette.---Get no herring in the pounds as the mesh is too large (Anderson).

Whitefish Point.---In the pound nets here used to get principally whitefish. Got a very few trout; would not be one per cent of trout (Clark).

In the early part of the ~~year~~ season we would get quite a nice size fish, and along toward the middle of the summer they would be small and thin, and the latter part of August and September we would get large fish again. The first run would average from 5 to 8 lbs. Our small run during the middle of the season would be from 4 to 6 lbs. Those that we got in the summer were apparently fully developed. In the spring they would be about the same as in the fall (Clark).

Whitefish Point.---In the pounds their principal fish is the whitefish. In the catch brought in today from the pounds there was not over 5 per cent of trout. They used to get less trout from the pounds in the beginning than they do now; would not take over 2 or 3 trout in perhaps 4 or 5 tons of fish. Their only other market fish taken in the pounds are the

sturgeon and a few wall-eyed pike which they get in September. That is all the marketable fish they get. The waste fishes are the 2 common suckers and the herring (Endress).

Whitefish Bay.---In the pound nets on the inside of Whitefish Point they catch principally whitefish; probably 5 per cent would be trout. On the outside of the point it is about the same (Pratt).

There were no herring there in the fall. Our catch was whitefish and trout; mostly whitefish. In the spring we used to catch a good many pickerel with the whitefish, principally at Taquamenon (Roach).

In the pound nets ~~XXXX~~ do not get many lake trout; simply whitefish. In a ton of whitefish would have perhaps 25 lbs. of lake trout. There is a run of large whitefish comes on the shallows in the fall where his pounds are. He has tried putting in the nets in the fall for 2 years, but they blow right out again. In the spring he gets whitefish and trout in the proportion of 9/10 whitefish to 1/10 trout. Then from the 1st of July you can say they are all whitefish until the end of his fishing. Get an odd sturgeon (Johnson).

Fix's pounds in Taquamenon Bay are in such shallow water that they take a different catch from Johnson's pounds. They take a good many sturgeon. Catches very few wall-eyed pike. Caught one black bass this spring, the only one he has ever seen from that region. There were some wall-eyed pike in his catch landed at the Soo today, but not many (Rathbun).

Whitefish Bay.---The fishes taken in the pound nets are principally whitefish, and lake trout are also taken. The nets near the mouth of Taquamenon River catch sturgeon and wall-eyed pike. Yellow pike are not very plentiful and the sturgeon are not common. The main thing is the whitefish; not very many trout (Ainsworth)

The nets along Salt Point, Whitefish Bay on the American side, they figure will not catch any ~~white~~fish until the middle of June or first of July. They catch whitefish in the latter locality until the nets are forced out by the storms, but July is the best month; August is a good month, however. They get some lake trout with the first run of whitefish in the spring, and then do not catch any trout to amount to anything through July and August, but in

September they catch trout again, and when the nets are fished into October they catch large quantities of trout in the pound nets(Ainsworth)

This morning their boat in the lower part of Whitefish Bay brought in 3,500 lbs. of whitefish, 170 lbs. of trout and 71 lbs. of sturgeon. That was yesterday's catch (Ainsworth).

Waiska Bay.---According to the workmen on the shore they take in the pounds here many suckers and perch, some small mullet, pike and pickerel, and a few sturgeon. These pounds are only fished during the first part of the season (Rathbun).

Waiska Bay.---This refers to a pound net which he states was set in Waiska River about 1/4 mile from the mouth. They caught pike and pickerel; does not think they got any whitefish. The whitefish are not in the habit of frequenting that water, but pike and pickerel go up 4 or 5 miles. There would be some whitefish around the mouth of the river (Kirvan).

St. Mary's River.---Lake George has shallow water, about 20 feet deep. The pound nets there take wall-eyed pike, black bass, whitefish in the fall, and probably a few wall-eyed pike (Wires).

St. Mary's River.---Below the Soo there is one pound in Lake George and one in Hay Lake. They do not catch many fish in these nets, but he knows very little about them ()

North Shore.---The nets in Goulais Bay on the Canadian side are put in for whitefish almost entirely, and they figure that those nets do not catch any whitefish after the middle of July. They take them out after the middle of July as the fishing is done.

In the pound nets along that shore they do not get much of anything but whitefish and trout, and nearly all whitefish (Ainsworth).

In the pound nets along the Canadian shore they catch scarcely anything but whitefish and trout. Very seldom take any whitefish under 1 1/2 lbs. dressed, owing to the large size of the mesh in the pot. Not many lake trout are taken in the pound nets (Ainsworth & Ganley).

North Shore.---On the north shore the market fish are simply whitefish and trout except in Goulais Bay there are some yellow pickerel (Elliott).

Port Arthur.---Year before last we had the greatest year we have ever had in this bay. out of one pound net a man took 5 tons of fish (Marks).

In June and July, if you are setting in the bay, get pickerel mostly, and outside get whitefish and trout. In the latter part of the season, August and September, the catch is pretty light, sometimes whitefish and sometimes pickerel, but mostly ~~white~~ pickerel. Get very few whitefish in the bay at any time of the season (Trombley).

Our run of trout does not seem to lead in the pound nets when the whitefish are here; do not seem to catch the same kind of whitefish, but catch what we call the menominee, and some pike, buffalo, and probably a few sturgeon (Servais).

The best trout are caught the last weeks in June and first of July. Whitefish come some what earlier, and also in August. Yellow pickerel are taken in most abundance in August (Trombley).

In the pound nets the principal fish are whitefish, trout and pickerel. In the spring get more whitefish than trout, but from July 15 to the end of August, he gets more pickerel than anything else. For August my catch is $2/3$ yellow pickerel. Do not get many trout now; get them mixed up with the whitefish in June and July. Will not get half as many trout as whitefish, not more than $1/4$, and would get about $1/3$ as many pickerel as whitefish; half whitefish and the other half pickerel and trout, but more pickerel than trout (Servais).

There are several varieties of fish taken, such as lake trout, whitefish, pike and sturgeon. Trout are caught in greatest abundance in September and October, while the best run of whitefish usually occurs in the spring. About the only waste fishes taken are suckers and a few ling or lawyers (Brunson).

The waste fishes are suckers, both the common and large-finned, ling and a few cat fishes (Nuttall Bros.)

POUND NETS; CATCH -- LAKE SUPERIOR.

Port Arthur.- In the pound net catch there is generally about $1/3$ whitefish and $2/3$ trout.-(Marks).

Bete Grise.- Mr. Berriault, who is fishing pound nets at the mouth of the Montreal river, speaks highly of the location for pound nets. On July 18, he took 2,223 lbs. from four nets, and last season took as many as 2,400 lbs. from two pounds. Also took last season $11\ 1/2$ kegs = 1,150 lbs. from five gill nets of 60 feet each.-(Woolman).

POUND NET CATCH; SEASON---LAKE SUPERIOR.

(WHITEFISH AND TROUT)

Marquette.---The pounds have runs of whitefish, but when the run is over they do not catch any more. They get 2 or 3 little runs in the summer and then they drop off, but when they do have these runs they just slay them. They catch a few more trout early in the spring than anything else. Then they get a little run of whitefish, and about the middle of June the first run of whitefish is over. They generally get another run about this time, and it is generally a pretty good run. Then they would get a trout run in the fall. They do not get many whitefish in the pounds in the fall. August is the principal month for whitefish with the pound nets (Grant).

Marquette.---The first thing in the pounds in the spring they get whitefish and trout together. Get more whitefish in the beginning than they do trout. Heretofore would get more whitefish than trout during the summer, but this year it is the other way (Anderson).

PROPORTIONATE CATCH OF TROUT AND WHITEFISH IN
THE POUNDS -- LAKE SUPERIOR.

Whitefish Point.-- At the present time the proportion of 200 lbs. of trout to 1 ton of whitefish would be big at this season. Later in the year there will not be so many trout in proportion.--(Shaver).

Port Arthur.-- Nearly all the fish marketed at the time Mr. Davis fished, were caught with gills.--(W. H. Davis).

WHITEFISH--LAKE SUPERIOR.

POUND NET CATCH.

BASED UPON FIGURES BY STATISTICAL DIVISION.

State and County.	Average catch per net.		Percentage of increase or decrease.
	1890.	1893.	
Minnesota	900	1,006	+11.7%
Wisconsin:			
Douglas	8,725	2,819	-67.7
Bayfield	6,521	2,299	-64.7
Ashland	13,067	1,118	-91.4
Michigan:			
Isle Royale	11,419	889	-92.2
Gogebic and Ontonagon	3,621	1,564	-56.8
Houghton	8,071	6,756	-16.3
Keweenaw	12,150	13,038	+7.3
Baraga	7,333	3,243	-55.7
Marquette	800	2,030	+153.7
Alger	6,906	3,447	-50.
Chippewa	24,000	10,235	-57.3

POUND NETS--LAKE SUPERIOR.

1894.

HARMFUL FEATURES.

ISLE ROYALE, MICHIGAN.

Jno. T. Johns, Isle Royale.---Thinks the pound nets soon clean out all the fish. One man who tried it here and did well, soon had to move to other grounds on account of disappearance of the fish. Thinks the pound net cleans out small fish of all kinds. Would not suggest any restriction.

WISCONSIN (South Shore).

J.E.Cooley, Duluth.--- Thinks too much pound fishing was one cause of the decrease in the fish. Never were fish enough taken in the spawning season to have depleted the whitefish. Pounds were not especially responsible, in his opinion, for decrease of

whitefish, because they fell off all of a sudden 10 or 12 years ago.

Jno. Coventry, Duluth.---There were probably 100 pound nets operated along this shore from 1876 to 1882, at which time the catch of whitefish was very large, but the pounds seemed to clean them all out at that time, so that it was no longer profitable to fish for them.

Edward S. Smith, Duluth.---Considers pound fishing very harmful. Attributes the depletion of whitefish to the large number of pound nets and seines formerly used, and says stop should be made to cleaning out whitefish every year in pounds and seines.

APOSTLE ISLANDS AND ADJACENT MAINLAND,
WISCONSIN.

M.B. Johnson, Bayfield.---There has been much destruction of whitefish by taking too many small ones. Thinks that has caused the decrease in the catch. Fly nets, or anything

to catch the fish were formerly used. Used very small mesh too, he has some old pound nets now in storage, in which the mesh is not over $1/4$ inch square. As far as he knows, they haven't used such small mesh since he has been here.

Irving Chafe, Bayfield.---- Pounds and sei seines are the only causes he knows of for the decrease of whitefish.

Capt. Swannec, Apostle Islands.---- Mr. Le Due. first packer on the "Currie", says that all pound nets catch small fish weighing as little as $1/2$ lb. This is especially true in large lifts where many fish are taken, and the larger fish go to the bottom, and that few if any, of the fishermen allow the small fish to escape, but they are salted as small as $1/4$ lb. The fishermen are so anxious to retain the small fish, that they sometimes put finer nets on the outside of the pot.

Joseph La Belle, Bayfield.--- Thinks the small mesh formerly used in the pound nets helped to decrease the whitefish. Doesn't think the present mesh tends to decrease them much.

BETE GRISE, MICHIGAN.

Joseph Crose, Houghton.--- Thinks the pounds take too many young fish.

KEWEENAW BAY TO WHITEFISH POINT,
MICHIGAN.

A. Grant, Marquette.--- Lots of small white fish are taken in the pound nets. Get what they call "runs". Has fished a pound at Big Bay, and as soon as they got the net in, one season he was there, they got a run of medium sized whitefish, and along in August a run of small whitefish came and went into the lead

and gilled all through the pot. As they could not be marketed, they were of no use, still they were gilled and destroyed. The lead was 3 1/2 mesh, and the pot smaller. The pound nets right here at Marquette, are not so injurious to whitefish, because the small whitefish congregate right inside the harbor where they cannot set pound nets. Lots of small whitefish go into Big Bay and around Grand Island, though there is no question, but that the pounds have been destructive in certain places by catching so many small fish.

J. Goodwin, Marquette.--- There was one man at Grand Island who used some very small pound nets (doesn't know the size of the mesh) for 10 or 15 years. They caught very small whitefish there some years ago in these small meshed nets, and any quantity of them. The pound nets down there have been responsible for the decrease of whitefish by catching so

many small ones. They would dip them out of their nets, let them go, bury them, etc. You could get all the fish you wanted there. They salted fish there to a considerable extent at that time. This was 15 or 16 years ago. He has not been down there for 11 or 13 years, and doesn't know how it is now. We have never fished such small meshed nets around here. Has seen young whitefish as thick as they could bag in the pounds at Grand Island.

WHITEFISH POINT AND VICINITY,
MICHIGAN.

Jno. Clark, Whitefish Point.---Years ago I used to see quantities of fish brought ashore from pound nets that were too small for dressing or other purposes. Pound nets are likely to do most injury in catching off fish as compared with other methods.

F.W.Roach, Whitefish Point.--- Thinks pounds destroy too many small fish.

CANADA SHORE,

WHITEFISH BAY TO SLATE ISLAND.

Maj. Elliott, Soo.--- Where pound nets have been used down east here, they have been very destructive to whitefish. One man said he saw 22 bbls. of young whitefish going through what they call the gut pile in one morning. The mesh in the nets was 1 inch bar. As a rule the fishermen are in a hurry when they lift the nets, and just scoop everything right up, both large and small fish. The men are hired by the month, and have no interest.

PORT ARTHUR REGION, CANADA.

R. Rathbun.--- No cause can be assigned to absence of fish in Thunder Bay, except over fishing.

A. Murray, Port Arthur.--- Pounds are notably responsible for catching small fry, and therefore for the decrease of fish, especially whitefish.

CATCH OF POUND AND GILL NETS.

LAKE TROUT AND WHITEFISH SEASONS;
POUND AND GILL NET CATCH IN DIFFERENT SEASONS.
LAKE SUPERIOR.

Minnesota.-- In the winter fishing they get Lake trout with hook and line.--(Wires).

Wisconsin.-- On the south shore, when he was fishing, they never did much with trout in the fall, except across in the middle ground in November, but did not fish much there either. (Cooley).

Isle Royale.-- Here we catch most trout in October and most siscowet in July. Trout are caught right on the spawning grounds.-- (Johns).

Minnesota.-- Trout fishing has been mainly in the fall during September, October, and November. May try for them the last part of August. Seldom do any fishing for them in the spring. They are not abundant then or during the summer, but may get small ones in the herring nets. July 3rd, 1894, took about half a dozen in the herring nets, the largest of which did not measure over 16 or 18 inches

long.--(Borgensen).

Bayfield.-- The best fishing here for trout in the fall is in the spawning time. Thinks they take about the same amount of trout in the spring as in the fall. During the last part of September and October they get a little the best fishing of the year, although the early spring fishing is nearly as good. The spring run of trout is not as sure as the fall run. Sometimes there is no spring run at all, but the fall fishing is always a sure thing.--(Chafe).

Marquette.-- Late in the fall they catch the trout in the pound nets, but not so much during the rest of the year. The later they keep their pound nets in the more trout they get in the fall.--(Grant).

North Shore.-- There is a run of shoal trout of which they generally catch about 2 tons in the spring, and they can hardly tell where they go to. These trout they do not protect in Canada as they claim they cannot be taken in the summer and the only time you can take them is when they come on to spawn. They

are a large fish running from 5 to 8 lbs.

They get them sometimes the 25th of November and they would last about 8 or 10 days. Sometimes they will come on probably a week later, according to the moon.

There are a great number of Government people in Canada who do not know anything about fish and think they come on at the same time every year, but a man who makes a study of it knows that the dark of the moon is not the same every year, sometimes there is a week or 8 days difference in the dark of the moon and sometimes storms will keep the fish off for a few days. This large shore trout they do not find at any other time of the year, except once in a while they may catch 1 when they get up in shallow water.--(Ganley).

Port Arthur.-- The principal catch is made when the fish come in to spawn. You cannot stop it on account of the whitefish run. About the middle of October, of course, you get more trout than whitefish in the proportion of 3 to 4.--(Marks).

Our trout season begins about September

15 and lasts until about October 15. Pound nets outside of the Bay in June and July catch trout and whitefish mostly. The best trout are caught the last weeks in June and first of July. This is with pounds.--(Trombley).

One of the 3 principal fishes taken in the pounds. In the spring get more whitefish than trout. Do not get many trout now. Get them mixed up with the whitefish in June and July. Will not get $1/2$ as many trout as whitefish, not more than $1/4$, and we get about $1/3$ as many pickerel as whitefish. $1/2$ whitefish and the other $1/2$ pickerel and trout, but more pickerel than trout.--(Servais).

In the gill nets in the fall take all trout.--(Servais).

Our run of trout does not seem to lead into the pounds when the whitefish are here in October.--(Servais).

Trout are taken at almost all seasons, but the best run we get the latter part of October.--(Davis).

PROPORTIONATE CATCH BY POUNDS AND
GILL NETS--LAKE SUPERIOR.

West End. The proportion marketed at this end would be about $3/4$ gill nets and $1/4$ pounds. On the north shore they are nearly all gill nets. (E.S.Smith).

Sand Island. Possibly $1/5$ of the fish marketed from this island are caught in pounds. (Shaw).

Bete Grise. During the time he was fishing more fish were taken in pounds than gills. (Croze).

Montreal River. Gill nets take smaller number of fish than pounds; the latter average about 90%. (Berriault).

Portage Entry. Pound netting is on the increase. At present more than half the fish taken in this bay are caught in pounds. A year ago less than $1/4$ were so taken. (Quinn).

Grand Marais. By far the greater number are taken in gills; possibly 5% in pounds. (Connable).

Port Arthur. From here to St. Ignace the proportion of catch is about 1/2 for each gills and pounds, for the entire year. (Trombley).

When he began fishing all of the fish marketed from Port Arthur were taken in gill nets, but the pound has gradually grown in favor, until at present 75 to 90 per cent. are pound net fish. (Trombley).

From here to St. Ignace 80 per cent. of the fish are taken in pounds during the open season. Taking into consideration the winter catch, however, the pounds do not take over 50 per cent.

POUNDS, GILL NETS AND SEINES--LAKE SUPERIOR.

RELATIVE AMOUNT OF FISH TAKEN BY EACH.

Wisconsin; pounds and seines. They do not take nearly as many fish seining as they do with pounds on this shore. (E.S.Smith).

Port Arthur. More fish are caught in pound nets under all circumstances. The proportion of fish marketed from pound nets here was at least $2/3$ of the whole. (Brunson).

The proportion of fish marketed is $2/3$ from gill nets and $1/3$ from pounds. (Murray).

Nearly all the fish marketed from here, 95 per cent, are pound net fish. (Maloney).

RELATIVE HARMFULNESS OF GILLS AND POUNDS--
LAKE SUPERIOR.

Port Arthur. Gill nets are the most harmful method of fishing, because you can go and catch them anywhere you like, wherever you can find them, and with pounds you cannot do it. That is where the difference is. If there are no fish on the shores you cannot get any in the pounds, but with gill nets you can go and get them anywhere. You catch more fish with the pound nets, but still the gill nets do the most damage. (Trombley).

Pound net fishing, if properly operated, is not as detrimental to the supply of fish as gill netting; since the small ones are of no use, and are turned loose, and with the pound net the fish cannot be followed. The net is set, and if the fish do not come to

it it catches nothing, and, if moved, it costs another \$50, besides a great expense. Gill net fishing is more destructive than pounds, since the fish can be followed from shallow to very deep water, and can keep after them all the time. The smaller fish cannot be returned alive to the water. (Trombley).

The most small fish are caught in the pounds, but believes the gill nets do as much injury to the fish as the pounds. A great many more of the fish caught in the gills are never sold, and some gill nets are lost. In the past the gill nets were worse than now. (Servais).

Does not believe gill net fishing destroys many fish. Does not destroy as many as pounds. (Murray).

CATCH OF POUNDS AND GILL NETS COMPARED,
LAKE SUPERIOR.

Port Arthur.---I was catching out of one pound net about 2,200 lbs. and a man fishing gill nets next to me was not catching anything. He set 2 boxes of gill nets around my pound nets and lifted them the next morning. I did not lift mine the next morning, and he had 75 lbs. of fish, and the next morning I lifted mine and I had between 1,900 and 2,000 lbs.(Servais).

RELATIVE HARMFULNESS OF POUNDS AND GILLS--
LAKE SUPERIOR.

(The question of catch of small fish has been considered under another heading).

Isle Royale. Pounds catch more than gills. Also clear out all the fish. (Johns).

Sand Island. Thinks pound netting is the proper method, now that the size of the mesh is regulated. Does not take spawners and cannot conveniently be set on spawning grounds. (Shaw).

Bayfield. In the early days the gills destroyed an immense amount of fish. Pounds do no destruction by catching spawners. The gills take a good many spawners, because they are fished in the spawning season. Tugs have run the fish off more than the pounds. (La Belle).

Keweenaw. Gills are not so destructive

as pounds, are more expensive and gradually losing favor. (Teddy).

Whitefish Bay. The least loss of fish is in the pounds. This is chiefly on account of their condition. Has thrown 2,000 to 3,000 fish away from 1 lift of gills, &c. (Johnson).

North Shore. Gills no doubt more injurious than pounds, chiefly on account of drowning and loss of fish in former. Also through losses by storms. (Ganley).

General. Thinks the pounds have done the most damage in decreasing fish. (Coates).

Port Arthur. Gills most harmful, because you can go and catch the fish anywhere you like, &c. (Trombley).

Gills do as much injury as pounds. Catch many fish that are never sold, &c. (Servais).

Seems to think gills most harmful. (Brun-

son).

Believes gill netting best for the fisheries. (Davis).

Pounds notably responsible for decrease, especially of whitefish. (Murray).

Pound netting far better for the fisheries. (Nuttall).

211.

CATCH OF GILL NETS.

GILL NETS; CATCH---LAKE SUPERIOR.

Minnesota.---The individual catch of the fishermen along the north shore would not amount to much as a rule. It amounts to considerable altogether, however, because there are so many of them (E. S. Smith).

Apostle Islands.---The spring catch is better than the fall catch, or possibly about the same thing (Johnson).

Isle Royale.---Knew of one boat catching 1100 packages in one month at Isle Royale(Chafe)

Apostle Islands.---No waste fishes are taken with their gill nets (James Smith).

West side Keweenaw.---The market fishes taken are trout, herring and whitefish. No waste fishes of any sort are taken except possibly a few suckers. Nearly all the fishes marketed about here are caught in gill nets (Teddy).

Portage Entry.---A few sturgeon are caught but are not marketed, being always smoked and eaten or sold to local dealers, or direct to the consumers (Quinn).

Marquette.---The fish he gets in the gill nets are whitefish, trout and a few siscowet. Does not go out far enough to get many siscowet. Sometimes goes out into 60 fathoms, and will get more of them then. Gets some blue fins at times in deep water. Never gets any sturgeon. Gets the lawyer occasionally and also gets suckers and wall-eyed pike in the gill nets (Hanson).

Grand Marais.---Among the market fishes taken is the common whitefish, black fin, long jaw, menominee, trout, siscowet, a few sturgeon, occasionally a batch of suckers, and also a few pike (Connable).

Whitefish Point.---The waste fishes in the gill nets do not amount to very much. Outside of the point where the water is colder they do not get a bloat but once in a while (Endress).

Whitefish Bay.---In the catch made by the tug E. M. B. A. on July 25, 1894, were whitefish lake trout, bloats, and one sucker; nothing else was taken (Rathbun).

Iroquois Island.---He catches whitefish and trout; nearly half trout. Catches no refuse fish (Ainsworth).

North Shore.---There are no waste fishes taken in the gill nets here to speak of (Elliott)

Port Arthur.---He has fished 15 boxes of gill nets that caught on an average 15 tons of fish per week (Trombley).

Port Arthur.---In the gill nets in the spring they get a little sprinkling of whitefish and in the fall it is all trout, and in the winter it is about all whitefish. They take some yellow pickerel in the gill nets, but not very many. In June they may get 1/4 pickerel (Servais).

Port Arthur.---No game fishes are caught (Brunson).

Port Arthur.---The only market fishes taken in the gills are trout and whitefish, while suckers, bloaters and lawyers are the waste fishes, all of which are good for food and doubtless will be used (Trombley).

Port Arthur.---The whitefish are caught early in the spring and through May, June, August and September ()

Port Arthur.---Most of the trout are secured in the fall months, principally October. Waste fishes in quantity are taken (Brunson).

Port Arthur.---The only market fishes taken are trout and whitefish. No sturgeon and very few suckers. With respect to the number of fish caught, some days a good haul is made and the next day the catch would be light (Murray).

Port Arthur.---Very few waste fishes are taken in gill nets except an occasional sucker and ling (Maloney).

PROPORTION CATCH OF WHITEFISH AND
TROUT IN GILL NETS--LAKE SUPERIOR.

North Shore. In the spring get an occasional whitefish, during the summer trout and occasional whitefish, and mostly trout in the fall. (Wires).

West End. Used to get trout and whitefish about equally divided. In November we would come up off Wisconsin Point to get the whitefish when they were spawning. During the summer, setting down more in the channel, during July and August, we would get whitefish and siscowet, about $1/3$ of the entire catch whitefish, $2/3$ siscowet--the numbers of each about the same, or a little more siscowet. In October used to go on the north off Lester river and London, when the trout commenced to spawn. No whitefish along this shore to amount to anything, not more than 1

or 2 in 1/2 ton of fish. (Cooley).

Twelve or 14 years ago they would take trout and whitefish on the south shore during the summer. They only kept that up for a few years, but up to the time they quit they got more whitefish than trout on the south shore during July and August. Before he gave up the business we would be bothered very much to get whitefish in the summer. Got so we didn't do any fishing at this end of the lake in summer. (See further under decrease of whitefish). Never was any amount of whitefish taken on the north shore on account of deep water. The whitefish fishing on Isle Royale was limited to close in shore, in the bays, where they were taken in gill nets principally. (Cooley).

West End. In the winter fishes about 12 miles out and 7 or 8 miles from land. Catches both trout and whitefish. (E.S.Smith).

Wisconsin. The gill nets along the south shore take about $1/3$ whitefish, the remainder being trout. (E.Smith).

Bayfield. Gill nets catch trout and whitefish. (Chafe).

Off Rice Island. On the off shore ground here, 40 to 110 fathoms, take nothing but trout and siscowet, with an occasional whitefish. This is during the first part of the season. (Swannes).

West side Keweenaw. Take trout, herring and whitefish. (Teddy).

Montreal River. Used to take most whitefish in August and trout in October. (Berriault).

Grand Marais. Common whitefish, black fin, long jaw, menominee, trout, siscowet, a few sturgeon, &c. (Connable).

Marquette. Whitefish, trout and a few siscowet. (Hanson).

Whitefish Point. Would not average $1/3$ trout all through the season. Used to keep away from the trout as much as possible because there was no market for them, but used to run off occasionally into deep water and get trout during the summer. We got principally whitefish. (Clark).

Used 6-inch mesh for the large whitefish, but never made a success of it on the shore. I took it outside and endeavored to use it on the sand bars, and used to catch large fish that probably would not gill in the small mesh. Years ago it was quite a business seining for those large whitefish. (Clark).

About $2/5$ of their gill net catch last year was trout, but they were fishing then at Caribou Island and Stannard Rock. In the spring of the year around here in the bay they get mostly trout. (Endress).

Make a regular business of fishing gill nets for the big whitefish, using 6-inch mesh, when they come in to the shore. (Shaver).

Whitefish Bay. On the gill net trip in Whitefish Bay which I took on Endress's tug, July 25, the catch consisted of 609 whitefish and 143 trout. (Rathbun).

Whitefish Point. On the outer shore between the point and Big Two Hearted River, used to fish chiefly within 4 miles of the shore. Got mostly whitefish. Taking the season through perhaps 1/4 trout. Many times would not get any trout at all, and there were places where you caught all trout. (Roach).

Whitefish Bay. On the flat at the mouth of Taquemenon Bay fishes gills during the spawning season for whitefish. (Johnson).

Whitefish Point. Between 1879 and 1886

fished on the outer shore between the point and Big Two Hearted River. In the spring would get about half and half whitefish and trout, but would get perhaps $2/3$ whitefish during the summer and fall. (Johnson).

Whitefish Bay. The man fishing from Iroquois Island gets whitefish and trout more or less all the time. (Ainsworth).

North Shore. In the gill nets Ainsworth and Ganley catch many more trout than whitefish, the proportion being about as 2 to 1. (Rathbun).

Port Arthur. Both whitefish and trout are taken, but the proportions are not given.

GILL NET CATCH --- LAKE SUPERIOR.

Wisconsin.-- After discussing the big catches of whitefish made in the pound nets along the south shore from 1876 to 1882, during which time the pound nets were very much more numerous than now, he stated that they cleaned the whitefish out so that it was not profitable to fish for them. They fished mostly pound nets in those years, after they began to get cleaned out the gill nets would not take enough to make it pay either in the spring or fall.--(Coventry).

GILL NETS; CATCH -- LAKE SUPERIOR.

Bete Grise.-- The Connable Company was doing a good business, each tug taking from 1,000 to 1,900 at a lift.--(Woolman).

Whitefish Bay, Waste fish.-- In the 40 gill nets lifted by the tug E. M. B. A. July 15, 1894, the only waste fishes were a quantity of bloats and 1 sucker, the latter coming from a depth of about 15 fathoms.--(Rathbun).

GILL NET CATCH--LAKE SUPERIOR.

	1890.		1893.	
	Lbs.	Miles.	Lbs.	Miles.
Minnesota	3,031		39,181	91.
Wisconsin:				
Douglas	9,401		1,510	0.4
Bayfield	353,223		31,222	46.3
Ashland	62,500		20,105	64.9
Michigan:				
Isle Royale	39,262		9,978	120.6
Gogebic and Ontonagon	57,093		39,395	25.3
Houghton	322,500		17,000	81.2
Keweenaw	93,720		49,260	6.4
Baraga	12,164		2,500	5.7
Marquette	29,978		23,300	22.6
Alger	44,640		30,272	18.1
Chippewa	60,000		84,370	15.7
Total	1,087,512	638.3	348,093	498.2

Average number lbs.to 1 mile gill netting

1890 = 1,547.

Average number lbs.to 1 mile gill netting

1893 = 696.7

DESTRUCTION OF FISH BY GILL-NETS.

LAKE SUPERIOR.

General.-- The pounds and gill nets have been practically responsible for the catching out of whitefish and trout; but there has been a great many more tons taken with the gill nets than with the pound nets in Lake Superior and Lake Huron.--(Wires).

General.-- The gill nets take very many small trout down to 1/2 lb. (See under mesh and fish).

The herring gill nets catch large quantities of young whitefish and in that way destroy them. We were trying to get up some legislation this spring by which herring gill netting could be stopped. No action was taken, but next winter we intend to get up the proper papers on this subject to present to the Legislature. Up on the north shore and Isle Royale no whitefish are taken in the herring nets, these nets being used only on a small scale for bait.--(Kalmbach).

Wisconsin.-- They are catching quite a

quantity of herring in the herring gill nets and among those herring are whitefish, but whether they are getting the latter in quantities sufficient to effect them materially, he does not know. He does not think they are, however.--(Cooley).

Isle Royale.-- Lost nets may still continue to catch some fish, but in deep water for a short time only, as they will sink to the bottom in 3 or 4 weeks on account of the corks becoming saturated with water.--(Johns).

Apostle Islands.-- The storms do not destroy many fish for them since their nets are set in comparatively deep water.--(Swannes)

Houghton.-- Does not think that fish held in lost gill nets are destroyed by storms.--(Croze).

Montreal River.-- Storms do not destroy the fish as they go too deep for the waves to have any influence upon them.--(Berriault).

Marquette.-- They have lost nets that they could not find, and possibly the next season they would come across them and there

would be dead fish in them partly decayed, and there would be no live fish around there.- (grant).

Marquette.- Two firms in Detroit had 4 or 5 tugs here about 12 years ago. They used to have good fishing before those boats came and they have never had good fishing since.--(Goodwin).

Marquette.- The tugs principally have destroyed the fishing. They use about 900 lbs. of twine. Thinks if there had been no tug fishing there would be plenty of fish and that if the tugs should stop there would be plenty of fish in a few years.--(Anderson).

Marquette.- Has never taken any white-fish large or small in his herring nets. Has heard Henry Anderson say that he had taken 2 or 3 some years ago. Thinks if tugs had never been allowed to fish in the lake there would be plenty of fish. Thinks a great many fish are destroyed in the gill nets and never utilized because they leave them out too long. They have so much netting set they cannot handle it properly.--(Lorntzson).

Marquette.- Believes the steamers are picking out all the fish. They use 1000 lbs. of gill netting.--(Hanson).

Marquette.- I could get no satisfactory information to show that young whitefish were taken in the herring gill nets, although they may be.--(Rathbun).

Whitefish Point.- There is nothing in the world in his opinion that will kill a fishing ground quicker than a tug. A tug will fish in 3 or 4 fathoms in the fall when fish are spawning.--(Pratt).

Whitefish Bay, etc..- You cannot prevent their catching young whitefish in herring gill nets.--(Roach).

Whitefish Bay.- The fishing ground around Iroquois Island was a very good one in the past. They could do just as well now provided the tugs would keep away. Since Booth has been fishing at Whitefish Bay the last two years they have crowded the sail-boats right out with their tugs. They set on the ground that we used to set on with sail-boats.--(Johnson).

North Shore.- They found that when they have early springs in Lake Superior they never have as good fishing as they do when it opens up a month later, because they have their nets on the ground before the fish start in out of deep water. This spring it was earlier and they got poorer fishing than they did last year. Most of the people attribute it to putting their nets on the ground before the fish come on the ground to feed. Thinks it very reasonable to suppose that with all that amount of twine around there, when it catches a fish it drives the rest off.(Ganley).

General.- Does not believe any sailboat should be allowed to use over 3 gangs of gill nets, as they lose too many fish from leaving them out on account of storms.--(Elliott).

Port Arthur.- Nets that are lost do not continue to catch fish since they are rolled and tangled.--(Trombley).

Nets lost and drifting do not catch many fish. They have been picked up with fish in them, but they are usually knotted and twisted so that fish could not become entangled.--(Davis).

Nets lost do not continue to catch fish
for any length of time, but roll up.-
(Maloney).

GILL NETS FRIGHTEN FISH--LAKE SUPERIOR.

Portage Entry.---Thinks that when too many nets are placed in a school the fishes are scattered and leave the grounds, but do not leave altogether (Quinn).

NETS FRIGHTEN FISH -- LAKE SUPERIOR.

North Shore.-- They do not catch the fish out as much as they drive them off with the nets. Moreover, for one fish they catch in the gill nets there must be 500 go over the tops.--(Ganley).

HERRING GILL NETS; CATCH -- LAKE SUPERIOR.

Minnesota.-- This morning (July 5, 1894) he took about 3 dozen herring from a net suspended at a depth of 2 or 3 fathoms. Day before yesterday, with a net on the bottom, he took about 8 herring, 6 cisco and the same number of trout.--(Borgensen).

Seldom do any fishing for trout in the spring, they are not abundant then, nor during the summer, but may get small ones in the herring nets. On July 3, 1894 took about half a dozen in the herring nets, the largest of which did not measure over 16 or 18 inches long. Do not take the trout in the herring nets when they are set near the surface.--(Borgensen).

West Side Keweenaw.-- The market fishes taken in the 2 kinds of nets are trout, herring and whitefish. No waste fishes of any sort are taken, except, possibly, a few suckers.--(Teddy).

Marquette.-- Does not take anything but herring in the herring gill nets, but small

suckers.--(Lorntzson).

Port Arthur.-- Take nothing but herring.--
(Trombley).

CATCH OF SEINES.

SEINES; CATCH --LAKE SUPERIOR.

3 Wisconsin.---Do not seine for anything but whitefish; but get a few wall-eyed pike. The latter, however, are about played out. Also take quite a good many herring and a very few trout. Also take lawyers, suckers, a few catfish, grass pike, and a little mixture of all kinds. But their principal catch would be whitefish and herring. (E.S.Smith).

Bayfield.---As he understands it, the whitefish feeding grounds are on a sandy or clay bottom and where the water deepens gradually.

Would not take any trout with the seines; nothing but whitefish (Johnson).

Bayfield.---There are lots of fish near the shore. Has seen whitefish 5 or 6 feet from the beach. Will come up that way in July (Chafe).

The seines took whitefish and herring; that was about all. There are not many herring on the shore when the whitefish are thick. No other but whitefish then (Chafe).

Never caught any trout in the seines to speak of. Seined two summers and did not get 100 lbs. of trout. Never get sturgeon (Chafe).

Wisconsin.---The only fish taken with the seines were whitefish, except a very few pickerel, and not unfrequently a sturgeon weighing 50 or 60 lbs. The sturgeon were not marketed (Draglund).

Bayfield.---Catch most all whitefish. Would never take any trout (La Belle).

West Side Keweenaw.---Apparently seine both for whitefish and herring.

Marquette.---Do not now fish for whitefish at all to speak of; only for herring (Grant).

Marquette.---Take anything that is in them, small whitefish and herring (Goodwin).

Marquette.---Get mostly all herring. Once in a while 1 or 2 small whitefish. Also take mullet and suckers. Never seined sturgeon (Lorntzson).

Marquette.---Gets herring. When herring come close inshore they use the seines, but a part of the time they keep offshore, so that they cannot use the seines (Hanson).

Marquette.---Used to seine for whitefish.

Now take herring almost exclusively. In one lot of herring which I examined the range in size was from 6 to 9 3/4 inches. There were not many of either the smallest or largest size, and no one size predominated. For sizes see under "Herring." There were no other species with the lot (Rathbun).

Whitefish Pt.---There is a portion of the season when you catch nothing but herring.

They take principally whitefish. Very seldom would get a lake trout, or a wall-eyed pike. The principal fish they got was whitefish, and in the early part of the season they used often to get a lot of suckers (Clark).

Caught a few hump back whitefish, but not many. Could not seem to catch them in the seines as they did the other fish. The large fish are usually caught at night and we never did much night seining (Clark).

Whitefish Pt.---Would get the big humpback whitefish in the spring, and along in Aug. used to get a big run of smaller fish. We did not used to get anything in the seine but whitefish, except once in a while a lake trout, and many brook trout (Roach).

Whitefish Pt.---Only get one lake trout, perhaps, out of 1,000 fish. They are about all whitefish. Get a few herring along early, but not so many afterwards. Sometimes they get lots of suckers (Kimball).

Whitefish Pt.---Had taken today whitefish and a few herring and suckers (Rathbun).

Whitefish Pt.---In the seines here they take whitefish, a few herring, a few menominee whitefish and some suckers (Endress).

SEINES; EXTENT OF CATCHES --LAKE SUPERIOR.

Wisconsin.---18 or 20 years ago had seen them haul a seine below Superior Entry when 20 men would dress all day on one haul and not half clean the fish out. Has seen them take as high as 150 bbls. of fish at one haul (E.S.Smith).

Wisconsin.---Ten years ago, at Bark Bay, his seine was hauled on an average about 8 times a day, with an average of possibly 50 lbs. of whitefish to a haul. In one haul made early in July, however, obtained 54 boxes equal to 5,400 lbs. Other fishermen made equally large catches, and in some cases were unable to land their nets so great was the catch; frequently the nets were lifted, allowing the fish to escape for several minutes before the nets could be drawn (Draglund).

Marquette.---The herring occur in schools or bodies of different sizes. A good single catch in their seines would amount to 4 or 5 bbls. Generally get much loss. The herring are not

on the bottom when schooling, but may be at any depth up to near the surface (Rathbun).

Saw Nels Hanson come in with the result of his seining for the latter part of the morning. It made only 1 gill net box about even full, not over $2/3$ or $3/4$ bbl. (Rathbun).

Whitefish Pt.---Some days when the fish came on good, I hauled as many as 1,200 or 1,400 lbs. at one haul, and that was as many as we cared to handle for the day. We might possibly get 2 or 3 such hauls a week (Clark).

Whitefish Pt.---We could not get barrels and salt enough in those days. Many a time we had 2 crews waiting for them. Have salted my seine boat full. One summer we caught, for three weeks, all the fish every morning at one haul that we could handle through the day.

Once, a mile above Clark's, I had my whole seine full of fish. We began hauling and they finally broke through. We took out about 4 or 6 rods of seine, and a good many of the fish got away, but finally we got them in so that we could

commence scooping them up, and we saved and dressed 60 or 70 bbls. I never saw such a sight in my life. I believe there were 10,000 bbls. of fish in that seine (Roach).

Whitefish Pt.---They do not make very much of seining about here. They have got some very heavy catches, but some days they would not see a fish, and some days they would get a big school (Endress).

Whitefish Pt.---They previous light keeper, they say, used to get any amount of fish. In one haul he has heard they have taken over 100 packages of fish, and now 800 or 1,000 (fish or lbs.?) is a pretty big haul, and they do not get that very often. They have only had one good season since he came here and then they caught 10 tons. It was about 6 years ago. During that season the gill net tugs were not doing anything at all.

Last year (1893) they hauled 6 times in one day with a big seine and every time they got about 100 or 150 lbs. - just a few each time. Sometimes they would get a good haul, and perhaps in the

next haul not get a fish. The seining is nothing to what it used to be. (Kimball).

The only other good year besides the one described above, since he has been here, was since then and they obtained about 8 tons. During two seasons we got only about 1,000 lbs. in the two years (Kimball).

Whitefish Pt.---While at the seine this afternoon, they told me they had taken about 1/2 ton of whitefish in the morning. I saw the seine hauled once, and they secured only 1 sucker (Rathbun).

SEINES; PROPORTION OF CATCH - LAKE SUPERIOR.

Wisconsin.- They do not take nearly as many fish seining as in pound nets.-(E. S. Smith).

SEINES; INJURIOUS FEATURES -- LAKE SUPERIOR.

(See also under Destruction of small fish).

Port Arthur.- Would prohibit seines as he has seen the evil effects of seining to the north of Port Huron on Lake Huron.--(Murray).

Wisconsin.- In his opinion the seines were never used extensively enough to have caused any decrease.--(Cooley).

Bayfield.- Thinks seine fishing is the most destructive to the whitefish of any method, for the whitefish come right on shore and no matter whether they use a large or a small mesh they will get a great many fish, for there are lots of fish near the shore. Has seen a whitefish 5 or 6 feet from the beach in July.

Thinks seine fishing should be prohibited entirely because it is so difficult to control. If the seine was fished right, it would be all right to do it, but you cannot regulate it. People who do not care about the welfare of the fish will fish small seines.--(Chafe).

3 Wisconsin.-- Is decidedly of the opinion that seine fishing did much damage and it should have been at the time and should be now entirely prohibited.--(Draglund).

Sand Island.-- Few young fish are taken with the large mesh, although many were taken when the fishermen used small mesh seines. In his opinion seining is not more detrimental than other methods of fishing if the proper size is used. It has been the experience of the fishermen that a seine can be profitably used only once in 3 or 5 years. Has never fished bait seines or nets of any kind.--(Shaw).

West Side Keweenaw.-- Does not see why the seine should be restricted especially if the proper mesh is used.--(Teddy).

Marquette.-- Seines have not been used here enough to do harm to any extent, compared with other places.--(Grant).

● Whitefish Point.-- Does not think the seining was extensive enough to hurt the fishing grounds any or cause any decrease. It never hurt the pound or gill net fishing, because there were not enough fish caught.

There are days when it storms and they cannot seine and we can work our pound and gill nets both. They have caught a good many small fish, still we have never noticed the difference. In the days when they got so many in the seines, we did not notice it because we got all we could handle as it was.--(Endress).

SEINES --- LAKE SUPERIOR.

West Side Keweenaw.- A few seines are used, but do not do any considerable damage as far as we were enabled to learn. Saw a seine drawn at the entrance of the Portage Canal that did not take a fish.-(Woolman).

SEINES; INJURIOUS FEATURES -- LAKE SUPERIOR.

Whitefish Point.- The seining does not amount to enough to do any harm. You have got to wait for the fish to come the same as with the pound nets.--(Pratt).

CONDITION OF FISH TAKEN IN

POUNDS AND GILL NETS.

GILL NETS--TIME OUT.

POUNDS AND GILL NETS--CONDITION OF FISH
COMPARED---LAKE SUPERIOR.

West End.---He brings his gill net fish in in better condition than the pound net fish. This is owing to the coldness of the water. He dresses all his fish on board. In the spring he usually carries a man along to attend to that. Pound net fish are not nearly as good to eat as gill net fish(E.S. Smith).

West End.---The best way to catch fish for keeping is by the pound nets. They get them that way in the best condition because they are all alive when they take up the nets (Flynn).

Isle Royale.---We think gill net fish are as good as pound net fish when taken out in time (Johns).

Bayfield.---Prefer gill net to pound net fish. If pound net fish are handled properly, however, they will ride just as far and last just as long. Very few fish die in the gill nets if they are lifted 3 nights out (Johnson).

Apostle Islands.---Gill net fish are not generally in as good condition as those taken from pounds, but he believes those taken from very deep water are as good on an average as those taken from pounds in warm water.

In his opinion the gill net fish are better than the pound for the market. Pound net fish are more difficult to preserve than gill net. They soften quicker on the ice, and this is especially true of the smaller ones or those taken where the water is somewhat warmer (Swannes).

Bayfield.---Pounds take the fish in the best condition. They are all right in the gill nets providing they are not left out too long (LaBelle).

Houghton.---Gill net fish in general not in as good condition as those caught in pounds, since the gill nets are sometimes allowed out too long. The gills, however, have an advantage in not taking so many small fish (Croze)

Keweenaw.---Would not venture an opinion as to relative condition. Gill net fish are bruised somewhat where gilled, but they usually come from deeper water and possibly are a little more solid than those from pound nets (Teddy).

Montreal River.---Pound net fish are in the best condition for market by far. When gill nets are not lifted as often as they should be there would be a much larger proportion of dead fish, from $\frac{1}{3}$ to $\frac{1}{2}$. The dead fish are all right for market (Berriault).

Portage Entry.---Pound net fish are in better condition than gill net fish when taken and will also keep better when shipped or salted (Quinn).

Grand Marais.---As to condition of gill and pound net fish does not see that there is much difference in their packing or shipping qualities at present. Used to be prejudiced against pound net fish as he thought they did not stand shipping as well as the gill net

fish, but has since come to the conclusion that it was due to the way they were handled. Pound net fish are those that come to the shallow water and the nets should be lifted every day, but they are usually lifted only twice a week (Connable).

Whitefish Point.---If they could bring pound net fish into the market within a day or two they would be a better fish, but the deep water fish will stand it longer than the shallow water fish. If a gill net fish has been dead in the net for 24 or 36 hours he is soft, of course, but he will be all right when put in ice. A pound net fish will not stand the abuse that a gill net fish will.

A great deal depends upon where a fish is caught as to how long he will live. In the fall we have 2 gangs of gill nets out and an additional one to go out and in with. Then sometimes a lot of fish will come in then and they are soft. The water gets warm toward fall and they will drown, especially after a

cold wind. Fish that get caught by the fin or like that will live a long time, but if he is caught so as to drown he will spoil in a very short time, but the great cause of all this is the currents.

The gill net fish will keep longer than the pound net fish as they are harder on account of their living in deeper water. The pound net fish look better, but do not keep as well (Endress).

Whitefish Bay.---The least loss of life is in the pound nets; that is he markets a greater proportion of his pound net fish in good condition. From a gang of gill nets he has at times thrown away anywhere from 2,000 to 3,000 lbs. That is when the gill nets would be out 10 or 15 nights in the fall on account of storms. In pleasant weather they would have probably no loss except a few dead fish.

The fish will remain in gill nets in good condition about 2 days, but it depends upon the water and the time. In Whitefish Bay in mid-summer in 2 nights out would get quite a lot of

dead fish in the gill nets (Johnson).

North Shore.---The pound nets catch a nice fish. A pound net fish as long as they are of proper size are in better condition.

Gill netting is more injurious to the fishing than the pounds without doubt. The gill nets are probably out 4 nights before lifting. The gill net twine is fine. As soon as a fish is caught and drowns it fills with air and bloats up, and as soon as the bladder bursts they are just the same as lead; they burst the twine and drop out on the bottom. Every time you fish a gang of gill nets that has been out 4 or 5 nights some of the fish will drown in half an hour, and when you fish up 6 miles of nets there must be a good many fish lying on the bottom. After you fish there 5 or 6 weeks you will have quite a large number of fish lying on the bottom. The pound net fish are all alive even if the pounds are left out 2 weeks (Ganley).

East End.---Fish taken in the gill nets are in as good condition and sell as well as those taken in the pounds. This is owing to the water of Lake Superior being so deep a short distance from the shore where the gill nets are fished. The fish are harder than the shallow water fish, the water being colder (Ainsworth).

North Shore.---The pound nets catch the fish alive and put them in the market in the best shape. Last year at the Lizard Islands I saw fish brought in from the gill nets that were soft, and I saw the fishermen give them to an indian who was cleaning and salting them; they were actually rotten; so soft that they were falling to pieces. They put them in brine and harden them up (Elliott).

Port Arthur.---The gill net fish do not stay in as good condition for market as the others; they are caught in deeper water but a fish taken in the gill net is generally worried more or less and are not as good as fish killed

fresh. Always found that the pound net fish were the best. A pound net fish if allowed to lay for any length of time will get soft, but if it is put on ice right away it will get hard as well as though⁷ it were caught in 100 fathoms (Trombley).

Port Arthur.---Gilled fish are by no means as good for market as pound net fish, and when they are worried and exhausted doubtless the effect is the same on fish as on other animals when worried to death or drowned gradually. The flesh of gilled fish is different from that of pound fish, being blood-shot and more or less colored. The flesh is also more or less bruised and begins to deteriorate very soon when bruised.

The quality of the fish caught in pound nets is not the same as that in gill nets at any time of the year. A gill net is generally out 3 nights and the fish remain in good condition that length of time. As a general rule do not get the fish in as good condition in the gill nets as in the pounds. The greater

the depth of water the firmer your fish are of course. Gill net fish bring as much in the market as pound net fish, but they are certainly not as good; they do not look as well and are not as firm. They pay the same price for them, however. I have known gill net fish to smell sour when taken out of the water. There is one place in Black Bay where if a boat goes down without ice the fish will be sour by the time she gets back (Servais).

Port Arthur.---Gill nets are hauled every 3 days and the fish are always in good condition. About 95 percent of the gill net fish are marketable. Claims that the gill net fish are not so firm as those caught in pounds and they do not like to handle them so well. Pound net fish are altogether preferable to gill net fish, a pound net fish being always in good condition (Brunson).

Port Arthur.---Nearly all the fish marketed at the time Mr. Davis fished were caught with gills; $\frac{2}{3}$ of those caught were marketed fresh and $\frac{1}{3}$ salted, with possibly a loss of 10 per cent out of the $\frac{1}{3}$ for soft fish (Davis)

Port Arthur.---Under most favorable conditions fish may remain alive in gill nets 3 or 4 days, but thinks that the average fish does not remain alive over 1 day, and by the end of the second day is not fit to be marketed fresh unless it is taken in very cold water (Davis).

Port Arthur.---Does not think gill net fish are in as good condition as the pound net fish, and always when gill net fish were plentiful Booth wanted pound net fish. If they were most abundant then the Company was very desirous of gill net fish. Believes pound net fish will ship farther and are more healthful for food. Fishermen will put on the market everything that they can possible sell. They fish through the ice, leaving nets out as long as 2 weeks and marketing the catch. Will clean the soft fish, put the blood of the

freshly caught fish over them, freeze them in snow or ice and sell them with those freshly caught (Davis).

Port Arthur.---Believes that gill net fishing is by far the best for the fisheries if the fishermen would act fair, lift nets often, and market only good sound fish. No fish unfit to sell fresh is fit to salt; that after it has begun to deteriorate no amount of salt can make it fresh again (Davis).

Port Arthur.--- Hauls each gang of gill nets only once a week when in very deep water. The fish are in excellent condition and will remain alive much longer and keep in good condition when dead, than fish taken out of shallow water. They will live for 2 weeks in 60 fathoms of water (Murray).

Port Arthur.---Believes gill net fish are in just as good condition as those taken in pounds. Pound net fish when taken in shallow water are apt to be tender. Fish cannot decay in deep, cold water. Has seen nets left in 3

weeks and the fish still alive and in excellent condition (Murray).

Port Arthur.--- Pound net fishing is far better for the fisheries than gill net, and much better for the market and the people who eat the fish. Possibly 95 percent of the fish marketed are pound net fish, which market better than gill fish. (Nuttall).

Port Arthur.---Gill net fish cannot be in as good condition as pound net fish since many are drowned and the live fish are more or less bruised with the twine. Believes that gilling is a poor way to fish, but would not restrict it (Nuttall).

Port Arthur.---Possibly 85 or 90 percent of the fish caught are from pounds, and of the possibly 5 percent gill net fish are salted; unfit for the fresh market (Maloney).

Port Arthur.---The gill net does not take as many small fish as the pounds, but the fish are in poor condition. Pound net fishing is not more detrimental than gill net fishing and yields better fish (Maloney).

Port Arthur.---Gill net fish are not in as good condition as pound net fish, since the former are more or less bruised and do not ice as well as those caught in the pound nets (Maloney).

RELATIVE CONDITION OF FISH TAKEN IN
POUNDS AND GILLS--LAKE SUPERIOR.

There is the same difference of opinion regarding this matter on Lake Superior as elsewhere; each class of fishermen thinking best of the condition of fish taken in his appliances. Much testimony was taken, but it has not been reduced. (Rathbun).

RELATIVE CONDITION OF FISH TAKEN IN POUNDS AND
GILL NETS -- LAKE SUPERIOR.

Port Arthur.-- The gill net fish are in poorer condition. The pounds yield better fish.--(Maloney).

GILL NETS---TIME OUT---CONDITION OF FISH.

LAKE SUPERIOR.

Minnesota(?).---The gill nets are generally set either 1 or 2 nights. Where they fish in a small way they lift their nets almost every day or every other day. Steam tugs can lift their nets every day (Wires).

General.---Fish will remain in good condition in the gill nets in deep cool water 10 or 12 days. In warmer water where it is shallow they will not remain in good condition more than 24 hours, but on most of the fishing grounds in lakes Huron and Superior if they are out 3 to 5 nights it is all right. Will have very few soft fish from fishing 5 nights out (Wires).

West End.---The sail boats calculate to leave their nets set from 3 to 4 days.

The fish caught in the gill nets will remain in good condition here longer than on Lake Michigan because the water is colder (Kalmbach).

West End.---Generally leave the gill nets in one night. If it becomes a little stormy may have to leave them a little longer sometimes. Occasionally they leave them in 3 or 4 days and when doing so obtain a good many dead fish (Coventry).

West End.---In the spring trout fishing usually lifts his nets 4 nights out. When the water gets warmer, 3 nights is a plenty (E. S. Smith).

Isle Royale.---Around Isle Royale they lift the gill nets every day when fishing for whitefish on the reefs, if the fishing is good. With trout they lift them 2 or 3 times a week, and the siscowet nets about the same (Flynn).

Isle Royale.---In summer we lift our nets about once a week, but in the fall every 2 or 3 days. In the fall we fish in shallow water where the fish will spoil sooner than in deep water, and where also the wind will soon destroy the fish and nets when loaded.

We think that fish will live in good condition for a week in gill nets, and have

seen them alive after 3 weeks; that is the gill nets had been out 3 weeks (Johns).

Lester River.---When fishing is poor they set only 1 or 2 nets as at present, keeping them out generally 2 nights before hauling. When these nets show the presence of many fish they add more, and when fishing becomes good they will set all the nets they have (Borgensen).

Bayfield.---Gill nets are supposed to be left out 3 nights. It sometimes depends upon the season. If the weather is cold a week does not hurt. At this season would keep them out 3 or 4 nights (Johnson).

Apostle Islands.---The nets are lifted every 4th day and only about $2/3$ of the fish are alive. Ordinarily the dead fish are in good condition, but are salted; the soft fish are thrown away. They average 5 lifts a week throughout the entire season, thus making an average loss of one day each week on account of storms. This refers to the tug Camp.

Possibly from this place $2/3$ or $3/4$ of the

fish are taken in gill nets, and a very small per cent of the fish taken are unfit for market. About $\frac{2}{3}$ of the fish marketed are salted. Nearly all of these are siscowet (Swannes).

Apostle Islands.---Nets are hauled every third day and the fish are usually in good condition. The length of time a fish will remain alive in gill nets depends entirely upon where it is gilled. If hung by the gills it dies very quickly; if caught by the middle of the body it will remain alive several days (James Smith).

Bete Grise.---When he fished there the nets were hauled every day and as a consequence very few fish were dead and all in good condition (Croze).

West side Keweenaw Peninsula.---The nets are usually hauled every third day. The fish are invariably in good marketable condition, not one in 20 possibly dying in the nets, and these are as solid as those taken alive, but are salted (Teddy).

Montreal River.---Nets are hauled every other day or every third day (Berriault).

Portage Entry.---Gill nets are supposed to be lifted every third day, and about half the fish taken are dead. The length of time a gilled fish will live depends upon where and how badly it is gilled. If caught around the body and not too much entangled, may live for several days. Does not think the intervals during storms bruise or kill the fish caught in gill nets (Quinn).

Grand Marais.---Nets are lifted every 4th day, taken ashore and cleaned.

Nets are hauled every 3 days, sometimes every 4 days; most of the fish are in good condition for marketing fresh, and all for salting (Connable).

Marquette.---A gang is out a week because they cannot handle more than one gang a day. The fish will not all keep in good condition, especially in shallow water. In the spring they will keep well, but the fall is the worst

time; the temperature of the water being warmer then than at any other time of the year.

Their nets remain out on an average 5 nights at least. They set in deep water for siscowet and sometimes leave the nets out 2 weeks. In shallow water they have got to take the fish up quicker or they will spoil. In warm weather in shallow water they should not be out over 4 nights (Grant).

Marquette.---The nets would remain out 5 or 6 days on an average, one gang being hauled each day (Goodwin).

Marquette.---Haul their nets now once a week, but formerly they used to haul them every 3 nights (Anderson).

Marquette.---Thinks a gill net should not remain out more than 3 days, but they leave them out a week sometimes, and in the fall when the weather is bad they sometimes leave them several weeks. This happens frequently; the gangs are so long and the nets so far apart that it is impossible for the tugs to handle them as often as they should be (Lorntzson).

Marquette.---Sometimes keeps trout nets set 7 or 8 nights and sometimes lifts them every 3 or 4 nights (Hanson).

Whitefish Point.---The condition of fish in the gill nets depends upon the depth of water they are set. In shallow water the fish will not live more than 2 or 3 days, and would not consider them fresh in shallow water after they had been more than 3 nights in the nets. When set in deep water where it is cool they are not in bad condition if left 6 or 7 nights out (Clark).

Whitefish Point.---They get very few drowned fish outside of the Point where the water is colder, but in the bay the water is warmer and the fish do not stand it as well. The same gang that was lifted today, if it had been around the point the fish would probably have been nearly all alive. In May and June we do not have a dead fish among them unless it is an odd one that gets its wind choked off.

At one time fish packed on the first of June and sent to Chicago arrived at Chicago on the 14th; they were repacked and sent to Kansas City. When they have stormy weather they will not last so long as the current drowns them and often in a day or two they will be as soft as mush (Endress).

Whitefish Bay.---Observations based upon the catch of 20 boxes of gill nets hauled by the Endress tug "E.M.B.A." on July 25, 1894. The nets were set in depths of 12 to 75 fathoms. These nets had been set July 19. As the nets were lifted and the fish removed a record was made as to whether the fish showed unmistakable signs of life or might be considered as dead or nearly so. For the number of live and dead fish the original record under Gill nets, Lake Superior, should be consulted (Rathbun).

Whitefish Bay.---The gill net fisherman at Iroquois Island would haul his nets about every 3 days. They can keep fish in good condition in the nets there for 3 days, but that is as long as they ought to be left out (Ainsworth).

Port Arthur.---The nets are usually hauled every third day or twice a week. It would be better if they were hauled every other day, and where set close to shore every day. Thinks that ordinarily a fish may remain alive 24 hours in a gill net, but this depends upon where the fish is caught (Trombley).

Port Arthur.---The nets are hauled every 3 days and sometimes only once a week, late in the fall. Would advocate hauling every second day (Davis).

Port Arthur.---Gill nets are hauled twice a week during the time the lake is open, but once a week when fishing through the ice (Maloney).

CONDITION OF GILL NET FISH--LAKE SUPERIOR.

The weight of testimony is to the effect that a large proportion of the gill net fish are unfit for fresh market, and have to be salted to harden and preserve. In some cases, also, many have to be thrown away. (Rathbun).

GILL NETS; TIME OUT; CONDITION OF FISH.

LAKE SUPERIOR.

General.- In Lake Superior you can leave your gill nets out 4 or 5 nights and your fish will all be alive and as bright as a dollar.- (Wires).

GILL NETS; TIME OUT---LAKE SUPERIOR.

Whitefish Bay.---In his early fishing there used to lift a gang and set a gang. Had only 2 gangs. We used to lift every day if we could. If we did not so lift it would be because we could not get out on account of the bad weather (Roach).

CONDITION OF FISH -- LAKE SUPERIOR.

East End.- The fish caught in cold water are kept better than those caught in warm water. The fish they have here after they have been a week in ice are as nice as you can get out of Lake Erie, kept only 3 days.--(Ganley).

Port Arthur.- No fish not fit for food should be put upon the market.--(W. H. Davis).

GILL NETS; CONDITION OF FISH--LAKE SUPERIOR.

Whitefish Bay. Trip on Endress' tug E.M.
B.A. July 25, 1894; 20 boxes of 40 nets, depth
12 to about 75 fathoms.

Omitting the first 3 nets, I tallied all the fish with reference to the number that were actually alive when landed on the deck. By a live fish was understood to be one that showed unmistakable signs of life, that was more or less active when extracted from the net. Many of the others were undoubtedly alive, and about all were in a fresh condition. As they were sometimes hauled in quite rapidly, I was not always able to observe as close as was desirable, but no fish was indicated to be alive unless he came under the above category, and any fault in the record was on the side of making the number of live fish too small.

The gang had been set 6 nights.

The depths given are only approximate.

In the following table the nets are numbered in the order they came up. The first number designates the live fish, the second the dead fish, in each instance. (Rathbun).

No. of net.	Depth in fathoms.	Whitefish.		Lake trout.	
4		6	5	1	1
5	12	3	6		2
6	12	14	10	3	4
7	14	9	9	2	3
8	15-16	24	16	2	
9	19	25	12	5	3
10	19-25	38	14	2	2
11	30 -	9	4		
12	35-40	1		2	
13	40-45	15	7	5	1
14 and 15	43-30	11	2	13	2
16	25-22	13	2		1
17	18-20	11	4		1

No. of net.	Depth in fathoms.	Whitefish.		Lake trout.	
18	15-18	15	9		2
19	14	4	3		1
20	14	10	5	5	2
21	13-14	2	2		
22	12-14	6	9	1	2
23	16	10	9	4	1
24		20	4	1	2
25	40	3			4
26	60	6			4
27	60-70	9	1	6	
28	70-75	13	2	12	
29, 30	60-28	10		6	3
31, 32	28-20	12	7	3	
33, 34	20-15	8	5	2	
35	15	9	20	4	1
36	15	9	11		1
37	15	18	16		2
38	15	15	9	3	1
39	15	11	18	3	
40	15	9	12	4	7

GILL NETS; BLOATING OF FISH TAKEN--LAKE SUPERIOR

The following observations were made on July 25, 1894, while out on Endress' tug "E.M.B.A." lifting gill nets in Whitefish Bay. The bladder in the whitefish and also apparently to a lesser extent in the lake trout, fill up with air when they come to the surface and more or less bloat the fish. When the whitefish are at all soft the bloating may go to the extent of breaking the flesh through on the lower portions. The fishermen use a stick with a sharp nail at the end with which they puncture the fish either after or just before it is taken from the net, making a small hole through which the air rapidly escapes (Rathbun).

OFFAL.

OFFAL--LAKE SUPERIOR.

Port Arthur. Not enough offal has been thrown in here to injure the fish. In former times were more particular about it than now. They take it ashore where they have a fishing station. The Swedes used to throw the offal in the bay at one time; the first years they came here, but they do not do it now. (P.Trombley).

There has been a large amount of offal allowed to go into the water here in the past, but there has not for the last 4 or 5 years. I had an idea that the offal would not drive the fish away, because around the fish docks there would be dead fish under the docks, and we found speckled trout would go around here, and they would not come around until those dead fish were under there; but of late he believes the fish offal drives the

fish away. Mr.Beebe says that the water purifies the offal, and what would a barrel of offal, more or less, be in this body of water? He thinks the greatest trouble is this: If you dump it anywhere near the setting grounds, you are liable to get it in the nets, but I do not see how it would do the fish any harm. (H.Servais).

Offal is thrown into the water, and this offense should be severely punished. (W.H. Davis).

First. Offal is thrown into the water, and especially is this true of winter fishing. If the offals are left on the ice in a box, the ravens will eat almost every thing, but if left on ice they are frozen into it and covered with snow, and finally reach the water in the spring. (Nuttall Bros.)

General. They do not allow any fish offal to amount to anything to go into the

lake. Never saw much of it dumped over. The sail boats are more apt to dump their offal than the steamers because they have not the room to keep it. Presumes the throwing over of offal has done some damage in earlier days, but does not think it has of late years. Thinks the whole trouble lays in too much fishing. Never has seen a place where he thought very much damage was done by throwing over offal. The fishermen do not like to catch that stuff in their nets, and if they do dump it, it is after they leave the fishing grounds and are on their way home. (Wires).

In the other lakes the fishermen are always very careful in handling the offal of their fish. It would be taken on shore and buried--they never allow any dirt to accumulate in the water, but here our fishermen throw every thing right back into the lake,

and he believes it destroys the fish grounds. Some clean their fish out in the lake and throw their offal overboard, and some clean their fish on the shore and take it out and dump it into the water. (M.F.Kalmbach, Duluth).

West End. Never had very much trouble with offal here. Never made a practice of throwing it into the lake. Once in awhile a boat would do it, but not to any extent. Doesn't think there was enough of it to have caused any decrease. (J.E.Cooley).

Bayfield. Another thing: Mr.Turner, the north-western manager of the Booth Company at St.Paul, claims that the offal being thrown in the lake drives the whitefish away, as do the saw-mills to a certain extent; and in the winter there are so many fishing with hooks and they clean their fish and leave the offal on the ice. But then the fisher-

men claim gulls come right along and eat it up. All of their boats' offal goes ashore at Rice Island. They have a boat on purpose for that. They bury it, and dump it away off on the island. They never try to utilize it. Take the offal from the siscowet trout and there is any amount of oil in it. The gill net men take their offal ashore as far as he can learn. (M.B.Johnson).

There used to be a good deal of trouble there (Isle Royale) from the offal, but there is not now. (I.Chafe).

Presumes likely they put offal on the ice in the winter fishing. Probably the fish are dressed on the ice and the offal left there. Their dogs eat a good deal of that, however, and does not suppose very much of it stays there. Most of the fish caught in the winter are dressed fresh, and the heads left on. (I.Chafe, Bayfield).

While fishing in the vicinity of Isle Royale, where the offal was emptied was frequently the best fishing grounds; that this theory is further confirmed by Mr. Shaw, of Sand Island, who says that in Lake Huron he found this to be decidedly the case; that the offal was undoubtedly fed upon by the other fishes, and that those nets in the vicinity of where this was emptied were invariably the most profitable. (S. Draglund, Bayfield).

Bete Grise. The offal was always buried. (Joseph Crose, Houghton).

The offal is not thrown in the water, but is buried; is of the opinion that the practice of throwing offal in the lake prevents the fish from coming in. (A. Berriault, Bete Grise).

Marquette. They never throw the offal back into the water here, but it has been

done in former times. He thinks it does harm. It is also bad for the nets, as it will drift into them, and they claim it drives the fish away. They have lost nets that they could not find, and probably the next season they would come across them and there would be dead fish in them, partly decayed, and there would be no live fish around there. (A.Grant).

Marquette. Some years ago they used to put some fish offal into the water here, but not to amount to anything. Does not think it ever did any damage. (J.Goodwin).

Decrease began when the tugs came here. They would throw the offal overboard, and that would kill the fish off. (P.Anderson).

Grand Marais. Offal is always buried; any other disposition of it would be unlawful, and, if thrown into the water, it would spoil the fishing grounds. Certain Finns re-

turn the offal to the water. (Connable).

Whitefish Point. There may have been a little fish offal in the neighborhood of the dock off the Point. Since that has been done there have been no fish caught in the seines there, as there used to be. That is at Endress' wharf. That wash from the dock all goes into the water, and it is a little heavier than the water and it usually works to the bottom, and there is a deep hole near there, and he thinks it works down into that. (John Clark).

Decrease of fish in the hole inside of Whitefish Point he laid to Indians dressing fish on the shore and letting the offal go into the water. This was in the earliest days of the fishery there. (F.W.Roach).

Whitefish Bay. Years ago they used to throw offal into the water. Port, Jones & Company were the first ones who used to ship

fish fresh from here. They started it a little before Endress came to Whitefish Point from Parisian Island. They would start to come down with their fish on tug, and they would have men aboard and dress the fish on their way down, and they packed them up at Point Aux Pins. They used always to throw their offal right overboard, and at Whitefish Point they used to seine and dress their fish right on the shore, and let the offal go right back into the water, and at Taquam-enon they had their fish houses built right over the water and let the offal run right into the water. But now he thinks they do not do it. (F.W.Roach).

Whitefish Point. Their offal is all carted from the lake and dumped, and the gulls and crows eat it up. The dumping of offal on the Canada shore has ruined the fishing more than anything else. One boat fished on

the north shore and dumped the offal as they cleaned the fish on the way down to the Soo. You take a ground where there has been a good many nets lost and very few fish will be caught there for several years unless it is a spawning ground, and the fish will go there then to spawn. Does not know of their dumping any offal in the water on the American shore. (Endress).

Whitefish Bay. Some of the fishermen dress their fish right into the lake, but it is something he has never done, and it is something none of the fishermen who live around here have ever done. The tug fishermen usually do it. He does not think Endress' people allow it, but Booth's people do. He brings his fish right ashore to clean them. (S.J. Johnson).

Soo. Fishing is not carried on extensively enough here in the river to have any of-

fal, and the Indians, when they catch fish in the spring, are supposed to carry the of-fal away and bury it. Their own fish are all dressed at the stations before they come in here. (C.E.Ainsworth).

OFFAL -- LAKE SUPERIOR.

Marquette.- Thinks they spoil the ground by throwing offal in the water. That was off Little Presque Isle. They had to leave there because they could not get enough fish to pay them. They spoiled the ground for both whitefish and trout. This refers to 4 or 5 tugs from other lakes, which fished here some 12 years ago.-- (Goodwin).

OFFAL --- LAKE SUPERIOR.

Grand Marais.- Would enforce the law rigidly concerning the burial of offal, as certain Finns return the offal to the water.- (Connable).

POLLUTIONS.

POLLUTIONS--LAKE SUPERIOR.

Duluth. Presumes Duluth does more harm right up at the head of the lake than any other city on the two lakes. Does more than all the rest of them put together. It is just simply the sewerage of the city. Their sewers empty right into the lake at different points. (Wires).

Duluth. The sewage of Duluth might affect the fisheries near here. (J.E.Cooley).

Marquette. There are no tanneries in operation in this region, but there used to be. There are gas works here that do much harm, as they let their refuse go into the water. The sewage of the town all runs into the harbor. They are making a pretty good system of sewage here. Dredging has caused some trouble here. The dredging has been done principally by the mining and railroad com-

panies in building wharves. They have got to take the refuse outside of the harbor limits. (A.Grant).

Soo. The Government dredges have spoiled the fishing in the rapids. (F.W.Roach).

Whitefish Bay, etc. There are no tanneries about here and no city sewage up his way, as the current is against it. (S.J. Johnson, Soo).

Soo. There are no tanneries or gas works here. (C.E.Ainsworth).

Port Arthur. We have no trouble with pollutions of any sort. (Servais).

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LOGGING AND SAW MILL REFUSE.

LOGGING AND SAW-MILL REFUSE--LAKE SUPERIOR.

West End. He does not think the lumber business has interfered with fishing at this end of the lake. The making up of rafts has all been close by the shore, and the same has interfered with pound net fishing, by the rafts breaking up and the logs going in on the shore. That has operated against the pounds for 10 or 12 years. The bark has not interfered very much, because it will not slip from the logs for about a year, and the most of the logs that are in the lake do not remain there a year. To some extent the bark is worn off by the grinding of the logs upon the shore. (J.E.Cooley).

Wisconsin. Log towing along the shores has greatly broken up this kind of fishing (pounds) in places. (Wires).

Wisconsin. A good deal of bark from logs

gets into the pound nets, and lays against and clogs the meshes. Tends to hold in smaller fishes than would otherwise be the case. (J.Coventry).

Rafting troubles him some by dragging the buoys away from his nets. (E.S.Smith).

Wisconsin. There were abundant evidences of the lumber interests every-where along the south shore. Logs are brought to the water's edge here all along, rolled in and made into rafts. There are also a few saw-mills scattered along. Almost the entire shore is lined with stray logs, and to some extent with slabs, etc. Logs were also scattered, floating at the surface every-where. It is easy to see how they might damage pound nets, and also the buoys of gill nets, and their floats, when they are set near the surface, carrying them away.

There are some pounds at Flag river,

which we got close to. They were still set, and were surrounded with logs, etc. There is also a saw-mill at this place. But there was no evidence of their having suffered.

(R.Rathbun, July 9, 1894).

Bayfield. A good deal of sawdust goes in- to the lake from the different saw-mills that are located on the edge of the lake. Also have more or less trouble with bark. At Devil's Island the Government contracted with a man to clear off a certain place for the light-house, and he rolled all the branches, stumps and every thing into the lake, instead of burning them, and it gave us a good deal of trouble for a year or two afterwards. (M.B.Johnson).

Saw-mills. Cannot say that the saw-mills have done much harm to fishing. Notwithstanding the saw-mills, the fishing has been good in the bay. (Irving Chafe).

Rafting. Does not think the rafting on the shores has made any particular difference in the fishing. (Irving Chafe).

Bark. Sometimes cannot haul seines near shore on account of the bark from logs. (Irving Chafe).

Drift-wood and water-soaked bark do the most damage to nets. (Capt. Swannes, Apostle Islands).

Apostle Islands. That the most damage to pound nets is caused by floating drift-wood, principally logs. These catch in the nets and, if the wind is high or current great, are driven through them, tearing the nets or pulling them loose from the poles; that during seasons when there is much logging business the nets are possibly damaged 25% of their value. (F.W. Shaw).

Apostle Islands. The nets are not damaged to any great extent, except by drift-

wood, which interferes with the nets nearest shore more than those farther out. Cannot give the amount of damage, since this depends upon the location of the net, the depth to which the poles are driven, etc. (James Smith).

Decrease of fish due more especially to the logging business, the distribution over the bottom of the lake of sawdust and bark. (James Smith).

Chequamegon Bay. As to decrease of white-fish, he (anon) thinks the mills have done much of the damage by throwing in so much rubbish. They do not intend to let it go in, but some does nevertheless. Saw plenty of logs, slabs, bark, etc., upon the shore everywhere along this part of the bay, but none of it looked fresh. There are six saw-mills at Ashland, and thinks there are two at Washburn. (R. Rathbun).

Ashland. While here to-day, July 11, 1894, visited the large Keystone Lumber Mill, which is said to be the largest in the place, and does a very extensive business. Has 1 band saw, 1 large gang saw, trimmers, lath machines, etc., but cuts no shingles.

All of the refuse is burned or used up in some way. They have a tall large-around iron stack or furnace, with a grate in the bottom, the top being covered by a hemisphere of wire netting. It may be 150 feet high. There are a few small doors just above and below the grate. Was told that they did not use a forced draft.

The refuse is carried in on the side toward the mill, about on a level with the roof of the mill, by means of a chain, working through a large wooden box or carrier. The screen at the top of the stack prevents the escape of the sparks.

Sawdust, slabs, edgings, etc., are employed in the furnace for making steam.

An employe told me that a small amount of sawdust was carted away. Not much of the refuse wood, however, was ever utilized as kindling about the town. He said it was generally understood that a mill could build out its ground to a certain extent by means of its refuse, but that being done they are then required by law to dispose of all their refuse without allowing any to go into the water.

This mill was built high above the ground, leaving a high place underneath the sawing floor, so that it was easy to arrange apparatus for carrying off the refuse, and it seemed to be very perfect in this mill.

Have noticed this same kind of burning stack about most of the mills in this region, but at some of the mills they have tall

brick chimneys, and probably a different kind of furnace.

The information I have received everywhere up to the present time along Lake Superior is to the effect that the mills obey the laws as regards the burning of refuse, or its disposition, but some of it gets away, and the fishermen claim that some little damage is done. The greater part of the damage, however, was accomplished before the regulations came into force. See the statements contained in the interviews with different fishermen.

There is undoubtedly much refuse in the way of edgings, slabs, logs, etc., everywhere along the beaches where we have been from Duluth to this point. (R.Rathbun).

Sawdust has done much towards ruining fishing grounds; thinks that the smaller mills have been more harmful than the larger

ones, since the larger ones usually burn sawdust or scraps and the smaller ones usually being located on some small river, allowing the sawdust to float down into the lake; that this should be prohibited in every case and that sawdust and debris from saw-mills, or at least kept from entering the fishing waters. (R.Connable, Jr., Bete Grise).

Marquette. Their nets are torn quite a good deal in bringing them up, by rocks, trees and stumps. Will sometimes bring up a tree, roots and all. There is a good deal of flood wood in the spring comes out of the rivers, and gets water-soaked, so that it sinks. There are places down around Grand Island that are full of this drift-wood and water-soaked logs. (A.Grant).

There is some refuse here from the saw-mills that comes in from the streams. The mills do not intend to let any refuse go in-

to the water, however. He thinks the refuse from the mills does more damage to pound nets than to gill nets, because it is strewn along close to the shore. (A.Grant).

Wherever the saw-mills run along the rivers they must do harm to whitefish. There are a good many saw-mills here in the rivers and the sawdust goes out of the rivers. Never hurt whitefish spawning grounds about here as there are none. (J.Goodwin).

Marquette. At the end of the town near the end of the breakwater the sawdust taken out from the mill sometime ago was banked up on the edge of the water and would be carried off by the currents. There was a saw-mill at Chocolate river and you can find the banks of sawdust lying there to-day. They find slabs and such stuff all over the bottom. Out of Dead river the rubbish that comes down from the mills comes down even to-

day. When they started the mill they cleaned the river out and all that stuff went out into the lake, and it was mostly roots, which are the worst thing they can have on the bottom.

Around the pound nets does not see any signs of saw-mill refuse. The stuff that comes out of Dead river is carried out into the lake and does not hurt the pound net fishing near the mouth of the river. The extensive throwing out of the rubbish in that river hurt the gill net fishing particularly. The rubbish came out of Dead river 2 or 3 years ago and it is still drifting out in the lake and the currents keep it going. The hearts of big logs which have decayed and of which only the outer part is fit for cutting up for lumber are allowed to drift from that mill in Dead river and pass out into the lake; some of it will water-log and sink,

and some of it will go ashore. They cleaned out the river in order to make room for logs. (P.Anderson).

Marquette. There is a large amount of sawdust around here and he gets some of it in his gill nets. And there are logs, etc., around here. (N.Hanson).

Whitefish Point. See under seines, history. Thinks logs drifted on shore, and bark caused decline of seine fishery. There was log cutting at Two Hearted river and the current was right to bring the logs down. Sawdust also used to drift down from Deer Park. (John Clark).

Does not know much about saw-mills, as he has not fished since saw-mills were put in here. (F.W.Roach, Soo).

Whitefish Point. They are not troubled with saw-mills here. The only thing they are troubled with is the bark of the saw

logs. Their nets get full of it. It is the worst stuff you can get for whitefish and trout. He has seen this on Lake Michigan also. They have taken whitefish here with their gills full of bark from logs, but the bark does harm principally to the nets. There are tugs going along with rafts two or three times a week. (Endress).

Whitefish Bay, etc. Never have trouble from saw-mills or anything of that sort where he fishes pounds now, but he did when he was in Taquamenon Bay. There was a saw-mill right in the corner near the point and he was bothered a good deal by edgings and slabs. But now they burn them. He thinks lumber has been accumulating in Waiska Bay for years. He would not say, as a whole, that the saw-mills are doing any damage to the fishing, as there are not enough of them. Log towing is a nuisance to the fishing. (S.J. Johnson).

In a great many places they have been in the habit of letting sawdust run right into the streams. Thinks there is a State law which prohibits this, however. (S.J. Johnson).

Waiska Bay. The beach along this bay, as far as I could see, was actually covered and destroyed by immense quantities of drift-wood rubbish. The beach itself consists of fine sand, and the bottom deepens very gradually beyond the beach, being also of fine sand. The rubbish consists of logs of all sizes, round and squared, pieces of sawed lumber, slabs, edgings, stumps, roots, bark, sawdust, etc. There was a perfect jam of this stuff all around the bay, and none of it appeared to be very fresh. Sawdust covered large areas of the bottom as far out as I could see. (Richard Rathbun).

According to the workmen, the drift ref-

use came only in very small part from the saw-mills on the north side of Waiska Bay. It mostly drifts in from outside, from the direction of Lake Superior. Nearly every winter, when there is a sufficient quantity, the mill people cut the larger pieces up into fire wood. Did so last fall and winter and nearly cleared the beach then, so that you could get along readily with a wagon on the beach. Some years the quantity of drift is not nearly so great as others.

(I was subsequently told by some one that while the mill may cut up some of this stuff into fire wood, the beach is about always covered in this way, and is never cleared much).

There is also a mill at Bay Mills, where they cut up wood for the new pulp paper mill at Niagara Falls. Use balsam and spruce. They have the largest tract of land of this

iron gauze, for burning their refuse. (Richard Rathbun).

Waiska Bay, etc. The saw-mill in Waiska Bay, there are no nets within 2 or 3 miles of it, and their sawdust is not put into the water, but is burned. He would say there is no trouble from sawdust here. (C.E.Ainsworth).

North Shore. No saw-mills on the north shore. (Elliott).

In Lake Superior we are not troubled with it, as there is no towing of logs on our side, except perhaps a little in Bachewausung Bay, 1 or 2 rafts a year. (Elliott).

Port Arthur. There are no saw-mills in this fishery division. Doesn't think there is a saw-mill on the Canadian shore of Lake Superior. (McDonnell, Port Arthur).

There is very little rafting done here. (P.Trombley, Port Arthur).

kind of wood of any pulp mill in the country. The logs come down Waiska river, and are quite small in diameter. They are cut into 4-foot lengths, loaded on scows or barges and towed to Niagara. The ends of the logs measuring less than 4 feet long are all set adrift, and I saw quantities of them about the bay. They are regarded as a great nuisance. No pulp is made at this place. The company, however, offered to locate at the Soo, and complete the water power canal begun sometime ago, but this privilege was for some reason refused them.

There are no brook trout in the lower part of Waiska river, but they are said to be abundant in the headwaters. It is a great logging river, at least for the pulp mill logs.

There are 2 big saw-mills at Bay View, both of which have large stacks covered with

CINDERS,

TRAFFIC.

CINDERS--LAKE SUPERIOR.

Marquette. You take it from here in the course of the lake steamers, there are ashes and cinders, and you can follow their course all the way from here to the Soo. Can tell it by picking up the clinkers in the nets. Does not know that they do much harm to the fish, but it tears the nets a good deal.
(A. Grant).

Marquette. Another thing that does damage to the nets is the steamboat clinkers. At Dead River there are roots and every thing else sent out by the Dead River Mill Company.

Mr. Anderson laid particular stress upon the clinkers thrown out by the lake steamers and which now amount to a great deal. There are many steamers running, and he thinks something should be done to prevent their

throwing over their refuse from the furnaces, as it causes real injury to their nets, and does much harm. (P.Anderson).

Whitefish Point. They are troubled some with cinders from the ships, but not to any extent and do not pay any attention to them. It is only on the regular course of the ships, but it is not enough to harm anything. (Endress).

TRAFFIC--LAKE SUPERIOR.

Near Duluth. The lake traffic, rafts of logs, barges, etc., running there all the time, keeps things stirred up and it has destroyed the fishing near the city. (Wires).

FERTILIZERS.

FERTILIZERS--LAKE SUPERIOR.

General. Does not know of their using any fish for fertilizing purposes in either of these two lakes, Superior and Huron. (Wires).

West End. Never used fish here for fertilizing purposes. Once in awhile, when a lot of fish spoiled, would give them to a man if he would haul them away, but never made a practice of using fish for fertilizing. (J.E.Cooley).

Marquette. They have never used fish for making fertilizers here, except that the farmers about here would use the offal sometimes, but they use very little of it now. They claim that it taints their produce sometimes. Now the fish offal is burned here, as is also the city offal mostly. (A.Grant).

Whitefish Point. No fish have ever been

caught around here for fertilizers, to make a business of it. (John Clark).

Fish have never been taken in this region for fertilizing purposes. (F.W.Roach).

Whitefish Point. Fishes have never been taken for fertilizing purposes here, nor on any of the lakes that he knows. (C.W.En-dress).

Whitefish Bay. Fish are never taken for fertilizing here. Has known suckers to be used for that purpose, but they would be fish that were taken along with other fish and not on purpose for that. (S.J.Johnson).

Soo. Fish are never caught about here to use for fertilizing purposes. (C.E.Ains-worth).

Port Arthur. Fish have never been caught here for fertilizing purposes. (P.Trombley).

They have never taken fish for fertilizing purposes here. (Servais & Beebe).